



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 5
77 WEST JACKSON BOULEVARD
CHICAGO, IL 60604-3590

REPLY TO THE ATTENTION OF:

DW-8J

October 20, 2003

CERTIFIED MAIL: 7001 0320 0006 0202 5103
RETURN RECEIPT REQUESTED

Douglas Roberts, President
Envirosafe Services of Ohio, Inc.
876 Otter Creek Road
Oregon, Ohio 43616-1200

**RE: Notice of Deficiency
RFI Phase 1 Report and RFI Phase 2 Workplan
Envirosafe Services of Ohio, Inc. (ESOI)
OHD 045 243 706**

Dear Mr. Roberts:

The U.S. EPA has completed its review of ESOI's RFI Phase 1 Report and RFI Phase 2 Workplan, both dated July 2003, for the ESOI facility in Oregon, Ohio.

Both Ohio EPA and U.S. EPA conducted a review of these documents. ESOI must address the deficiencies identified in the enclosure to obtain final approval of these document. Pursuant to permit condition VII. Schedule of Compliance, ESOI must respond to this Notice of Deficiency within 30 calendar days of receipt of this notice.

It is requested that you submit your responses to the deficiencies noted in the attachment rather than revisions to the original report and workplan. Once all revisions have been made agreed to, you will given time to make those changes to the actual RFI Phase 1 report and Phase 2 Workplan.

Please deliver your response to the list of recipients below.

Thomas Manning
U.S. Environmental Protection Agency Region 5
Mail Code: DW-8J
77 West Jackson Blvd.
Chicago, IL 60604-3511

Lynn Ackerson
Ohio EPA, NWDO
Envirosafe On-site Inspector
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Sandy Bauer, Librarian
Toledo Lucas County Library
Oregon Branch
3340 Dustin Rd.
Toledo, OH 43616-3399

If you have any questions regarding what information is required, please contact me at (312) 886-6943.

Sincerely,

A handwritten signature in black ink that reads "Thomas Manning". The signature is written in a cursive, flowing style.

Thomas Manning, Corrective Action Project Manager
Waste Management Branch

Enclosure

cc: Ed Lim, OEPA/CO
Lynn Ackerson, OEPA/NWDO
John Pasquarette, OEPA/NWDO
Sandy Bauer, Toledo Lucas County Library

**TECHNICAL REVIEW OF THE RFI
PHASE I REPORT, AND PHASE II WORK PLAN**

**ENVIROSAFE SERVICES OF OHIO
OREGON, OHIO**

October 20, 2003

PHASE I RFI REPORT

GENERAL COMMENTS

1. The Phase I RFI Report does not contain the level of detail that is typically included in an RFI report. EPA has made an agreement with EnviroSAFE that the Interim RFI Report may be submitted as a "Stream-lined" document. The introduction should be revised to clearly indicate the contents, and to explain that a complete RFI report will be submitted following the completion of Phase II activities.
2. Section 4 of the Phase I RFI Report presents an evaluation of data collected during the reconnaissance and Phase I activities for seven solid waste management units (SWMUs) (1, 5, 6, 7, 10, 11, and 12), three areas of concern (AOCs) (2, 6, 10), and three investigation units (A, B, and C). For each SWMU, AOC, or investigation unit presented, the discussion is concluded with recommendations for the Phase II investigation based on the results of the reconnaissance and Phase I activities. The recommendations for groundwater include the installation of additional temporary and permanent wells to further delineate the lateral and vertical extent of constituents that exceed the Maximum Contaminant Level (MCL) / Drinking Water Equivalent Level (DWEL) criteria. In other cases, resampling was recommended where insufficient sample volume was available in the Phase I sampling event or to confirm the exceedences of the MCL/DWEL criteria.

However, the recommendation to resample existing wells to confirm laboratory analytical results is a concern. Resampling to confirm concentrations was recommended for five SWMUs (1, 5, 6, 7, and 10) and two investigation units (A and B), but was not included in the Phase I RFI Work Plan as a characterization strategy. Resampling can be justified in instances where the analytical results may be unreliable due to suspected or documented problems related to sample collection in the field or analytical procedures in the laboratory. Resampling can also be justified to collect additional sample volume or to discern temporal trends in contaminant concentrations. However, resampling to confirm concentrations does not appear to be justified as a primary characterization method unless the Phase I analytical results appear suspect. In addition, interpretation of one

round of resampling can be ambiguous due to the difficulty in identifying the cause for the increase/decrease in concentration. The Phase I RFI Report should be revised to clearly indicate the justification for resampling and describe how the resampling results will be used to implement the Phase II Work Plan. In instances where the Phase I results appear reliable, consideration should be given to the installation of an additional downgradient well to provide additional information on the lateral and vertical extent of contamination.

3. The Remedial Facility Investigation (RFI) Phase I Report does not include a table that correlates the sample number with the sample location, and sample delivery group (SDG) making it difficult to evaluate the data. ESOI shall revise the RFI Phase I Report to include a table correlating the sample number with the sample location and SDG. Include a similar table in the Phase II Report.
4. Section 3.2 discusses data quality objectives (DQOs). One of the objectives is to collect data to support development and evaluation of corrective measures alternatives. The RFI Phase I Report and Recommendations for Phase II Investigation fail to provide a narrative explanation of how the development and evaluation of corrective measures will be supported by the data collected during Phase I and the data that is proposed to be collected during Phase II. ESOI shall revise the RFI Phase I Report to include descriptive language to support the proposed Phase II sample locations, along with the objectives of sampling at the proposed locations.
5. ESOI shall revise the RFI Phase I Report to include a Sample ID column and the associated Sample IDs for constituents listed on Tables 4.3a, 4.4a, 4.5a, 4.6a, 4.9, 4.10, and 4.11.
6. The following comments concern the dioxin and furan (CDD/CDF) analysis.
 1. According to the Phase I Data Summary Table for CDD/CDF analytical results, dioxins and/or furans were detected at the Areas of Concern noted in the table below. Using factors obtained from a Research Triangle Institute report (RTI 1996) Ohio EPA was able to reproduce the toxicity equivalents that ESOI presented on Table 4.3a: Summary of Soil Screening Results for Detected Constituents, except as noted below. All results should be reproducible. Therefore, revise the RFI Phase I Report to include a discussion of how the CDD/CDF equivalents were derived.

Area of Concern	Toxicity Equivalent Reproduced
AOC 2	No
AOC 6	Yes (max & min)
SWMU 01	Yes (max & min)
SWMU 05	No
SWMU 06/07	No
SWMU 07/10	Yes (max & min)

Area of Concern	Toxicity Equivalent Reproduced
SWMU 08	No
SWMU 09	No
SWMU 09/10	No
SWMU 10	Yes (min)

2. The Phase I Data Summary Table for CDD/CDF analytical results indicates that the number in parentheses is the sample quantitation limits (SQL). Table 1-1f, Compound List for Dioxin and Furan Analysis, of the approved RFI Work Plan lists the estimated quantitation limits (EQL). ESOI shall revise the Phase I Report to describe the difference between the SQL and the EQL and include a discussion of why the SQLs are higher than the approved EQLs. Resampling and analyses for these compounds may be warranted.

7. Ohio EPA split soil samples with ESOI at Millard Avenue Landfill (SWMU 5) locations T-20, T-21, and T-22. Due to delayed shipping to Ohio EPA's analytical laboratory, samples for metals analysis were the only samples that were analyzed within the required holding time. A review of the metals data indicates that, particularly for lead, ESOI's analytical results appear to be biased low. For several metals there was a relative percent difference (RPD) between Ohio EPA's result and ESOI's result, greater than 30%. ESOI shall use the highest detected value between Ohio EPA's data and ESOI's data in the cumulative risk assessment.

8. The RFI Phase I Report does not mention the intermittent pooling of water on top of Cell F (SWMU 1) and the New Oil Pond (SWMU 9). Pooling of water becomes evident when settlement caused by displacement of liquid and compressing of voids under the weight of material on top occurs. Depending on thickness of compressible layer(s), type of material and placement procedures, compression can continue for many years. The pooling of water on these SWMUs was evident during the on-site terrestrial habitat survey conducted on May 23, 2002, and is known by facility personnel to exist. In order to maintain the integrity of the landfill over time, properly designed landfills allow for water to be drained (via engineered slopes and ditches) from the landfill cap. Phase II of the RFI should include further investigation of the caps on SWMU 1 and SWMU 9 to better define the affected area(s), the rate of settlement, and the transition zones (differential settlement). Besides causing undesirable retention of water, settlement can damage components of the cap. ESOI shall revise the Recommendations for Phase II Investigation to include an investigation of settlement on SWMU 1 and SWMU 9 to ensure that these areas are addressed during the corrective measures study (CMS).

9. Given that ESOI has proposed Phase II physical properties sample locations over the newly discovered waste disposal areas around the North Sanitary Landfill (SWMU 6), the Central Sanitary Landfill (SWMU 7) and the New Oil Pond (SWMU 9), it is assumed that ESOI intends on demonstrating that the internal haul roads are an adequate cap. If this is the case, provide a cross section of the road/cap utilizing the Phase I step out borings. If there is not enough data from Phase I, propose additional Phase II boring locations to complete this cross section.

10. To aid in the interpretation of flow direction and plume extent in the upper till/ lower till contact zone, include a contour map of the lower till surface in the Phase II Report. The map shall specifically identify the location of upper till/lower contact wells that have sand deposits at the contact. The contours shall be based on well log data from all existing deep till and bedrock monitoring wells, including permitted monitoring wells, Phase I wells and Phase II wells.
11. Based on the plumes identified during the Phase I investigation the current ground water monitoring well spacing is not adequate to meet the requirements of OAC Rule 3745-54-97(A)(2). This rule requires the ground water monitoring system to consist of a sufficient number of wells, installed at appropriate locations and depths to yield ground water samples that represent the quality of ground water passing the point of compliance. The current ground water monitoring system consists of well nests placed at the corners of each of the waste units. Phase I activities identified plumes along the southern, western and northern borders of SWMU 5; the northern border of Cell F (SWMU1); and the northern and eastern borders of SWMU 6. The releases from SWMUs 1, 5, and 6 appear to be broad releases along the entire lengths of the cell borders. To adequately monitor the quality of ground water passing the compliance point along these borders, additional well nests (shallow till, deep till, and bedrock) should be installed along these borders located about the middle of each unit.

To meet the requirements of OAC Rule 3745-54-97(A)(2), submit a permit modification to add the additional wells discussed above to the ground water monitoring program.

12. Analysis results displayed in the data summary tables do not indicate that any constituents were detected below the estimated quantitation limits. The definition for the data qualifier "U" used in the tables is non detect. The "U" qualifier is followed by the sample quantitation limit (SQL) in parentheses, this may be indicating that the constituent was not detected at or above the SQL instead of the constituent not being detected at or above the method detection limit.

The baseline risk evaluation requires all organic constituents detected below quantitation limits to be included in the risk evaluation using a value equal to one half of the SQL. To ensure that all organic constituents detected are included in the risk evaluation, revise the RFI Phase I Report to provide a list of all organic constituents that were detected above the method detection limit for each SWMU and AOC. For Phase II, analysis results for those constituents that are detected above the method detection limit but below the estimated quantitation limit shall be reported with estimated concentrations ("J" qualified). The Phase II report shall include a list of all organic constituents that were detected above the method detection limit during Phase I and II for each SWMU or AOC.

13. During Phase I of the RFI, Ohio EPA split ground water samples with ESOI at monitoring wells BG-1D, BG-1R, T-5D, T-11D, T-20D, T-20S, T-37D, T-37S, and T-54S. Ohio EPA's analysis detected organic constituents that were not detected by ESOI's analysis. Some of the Ohio EPA detections are low, near or below the quantitation limit. However, all method blank analysis results are non detect and all trip blank results are non detect except for the trip blank for samples collected on November 13, 2003. The trip blank had acetone at 2.7 micrograms per liter (µg/l) and methylene chloride at 0.32 µg/l. This indicates that the low estimated concentrations detected in Ohio EPA's split

samples are real detections and are not the result of laboratory or field sampling conditions. The constituents detected in Ohio EPA's analysis are listed in the table below.

Well ID	Constituents
T-5D	acetophenone; bis (2-ethylhexyl) phthalate; di-n-octyl phthalate; acetone; and benzene.
T-20S	bis (2-ethylhexyl) phthalate; phenanthrene; pyrene; and acetone.
T-37S	benzene; ethyl benzene, tetrahydrofuran, and toluene.
T-54S	acetophenone; di-n-octyl phthalate; benzene; tetrachloroethene; and toluene.

In all data evaluations, screening and baseline risk assessment, ESOI shall use the highest analysis result of Ohio EPA/ESOI split sampling and analysis.

14. The September 2002 Progress Report, dated October 14, 2002, indicates that the following Shelby Tubes were re-collected during the reporting period:

- a. S-F20C7P1-052902-RLB-029 from SWMU No. 8;
- b. S-F20C7P1-052902-RLB-31 from SWMU No. 8;
- c. S-F20C7P1-071602-NAB-029 from SWMU No. 5;
- d. S-F20C7P1-071602-NAB-030 from SWMU No. 5;
- e. S-F20C7P1-071602-NAB-031 from SWMU No. 1;
- f. S-F20C7P1-071602-NAB-036 from SWMU No. 1;
- g. S-F20C7P1-071702-NAB-042 from SWMU No. 7; and
- h. S-F20C7P1-071702-NAB-044 from SWMU No. 7.

Neither the Progress Report or the RFI Phase I Report offer an explanation for the need to recollect the samples. ESOI shall revise the RFI Phase I Report to explain why these samples were re-collected and how that may effect making an accurate determination of the thickness of cover material.

Also, Table 4.1 provides a summary of the geotechnical data but does not indicate how it was determined that the RFI cap thickness criteria was met. The lab data sheets for geotechnical samples were provided in the November 2002 Progress Report, dated December 12, 2002. The data sheets indicate that none of the recovery results for the intervals sampled either met or exceeded 2 feet. In addition, many of the data sheets do not list the recovery. Provide an explanation of how it was determined that the RFI cap thickness criteria was met.

Finally, Ohio solid waste landfill requirements (Ohio Administrative Code 3745-27-08(D)(26)) give a minimum soil cap depth of 36 inches for counties along Lake Erie as a protection against freeze thaw damage. ESOI should comply with this minimum cap depth for the same reasons it is a solid waste requirement in Ohio (to ensure long term cap integrity) and because this depth is adequate to eliminate most potential eco-receptor contact with waste materials (which would have to be characterized to assess exposure with shallower cap depths). Additionally, as the guidance implies, ESOI should attempt to achieve greater precision when characterizing cap depths in these

areas. Measuring a minimum number of points only to the nearest foot (instead of inches) leaves a likelihood that cap depths in some areas are significantly less than the reported values. Areas reported as having 2 feet (or 3) feet of cap thickness require additional measurements and/or fill to verify they meet minimum cap thickness. The additional cap material added should inversely correlate with the number of confirmation cap measurement locations (*i.e.*, if ESOI chooses to assess cap depth in less locations, then more cap material depth should be added to assure the 36 inch minimum is met). If extra soil is warranted it should be applied following general landfill engineering principles (*e.g.*, adequate compaction, slope, etc.).

15. During Phase I of the RFI, ESOI investigated landfill gas at Cell F (SWMU 1), Millard Avenue Landfill (SWMU 5), the North Sanitary Landfill (SWMU 6), the Central Sanitary Landfill (SWMU 7), and the New Oil Pond (SWMU 9). In each of these cases ESOI indicates that "given the thickness of the existing cap is reasonably expected to mitigate any significant vapor migration, no further investigation of organic vapor levels is warranted." Explosive gas readings at these units exceed the RFI screening level by many times and explosive gas vents are only present at SWMUs 5 and 6. Given these findings, it is not clear that there is enough venting to ensure that lateral gas migration is not a concern and will not be a concern in the future. ESOI shall revise the Recommendations for Additional Investigation to include additional landfill gas investigation at SWMUs 1, 7 and 9. Also, see the specific comments below.
16. ESOI should submit an overall analysis of data, providing a holistic means of evaluation, to assess useability of sample results. This includes assessment of laboratory quality control (QC) problems (*e.g.*, half or more of surrogates are outside laboratory established limits - or for SVOCs, surrogates evaluated by fraction), exceedances of recommended holding times, etc. and these should be linked with the purpose of the sample. For example, if a sample has poor surrogate recovery but is supposed to demonstrate the extent of contamination, it is less likely that the sample results can be considered acceptable. This summary/ analysis should include numeric recovery percentages linked with laboratory quality assurance/quality control (QA/QC) limits to clearly demonstrate how far out of limits the recoveries were (as opposed to subjective assessments like "slightly" out of limits - as the data validation summaries include now) as well as clear documentation of holding times and exceedances (as compared with NFGs and the laboratory's QAPP). Also, if a sample is "J" qualified more than one time, the end result may be that the sample results are enough in doubt that they should be rejected.
17. Qualifying data should also factor in results of matrix spike/matrix spike duplicate (MS/MSD) samples especially when these QC samples are performed on samples from the same ESOI Sample Delivery Group (SDG) or when other QA/QC samples indicate a problem with the same analyte(s) or compound(s). This is particularly important when an MS/MSD indicates a problem with recovery of an analyte known to be present in the associated field sample or present in other samples from that SWMU/AOC. The data validation summaries indicate that "qualifiers were not added to the data results based solely on matrix spike and matrix spike duplicate results" but do not make it clear how these results were used in an overall assessment of samples. For example, if the same compound was within limits in the associated laboratory control sample (LCS) sample and surrogate recoveries were within limits for other samples in that analytical group, it could more confidently be assumed that difficulties were limited to matrix of the sample

associated with the MS/MSD.

18. ESOI should clarify that after the Phase II data has been collected, properly validated, and determined to be complete (based on additional samples to supplement gaps in determination of nature and extent, where indicated; completeness of acceptable samples and laboratory analysis for all units; acceptable populations for statistical evaluation; etc.) for each SWMU and AOC, then the human health and ecological risk assessment can be completed.
19. Habitats and associated receptors were eliminated without adequate justification. Despite the lack of success trapping small mammals during the investigation, many areas at ESOI are likely habitat for significant numbers of small mammals or other prey species which are in turn potential food for higher trophic levels. ESOI should evaluate the likelihood that contaminants could bioaccumulate from invertebrates (*i.e.*, earthworms) to small mammals/birds to higher trophic levels at significant levels. Contaminants with potential to bioaccumulate should be evaluated based on concentrations present in surficial soils down to three feet. The amount of surface soil sampling is insufficient to assess surficial contaminants (particularly for SWMU 6 where "cover" soils are less than three feet). ESOI shall revise the Phase II Work Plan to include additional surface soil sample locations. If the total number of valid samples is less than 12 per unit, maximum concentration levels should be used to assess potential risk.
20. It is unclear what cutoff ESOI is using for exceedances of ecological data quality levels (EDQL, a.k.a. ESLs). Where maximum concentrations exceed EDQLs (or Ohio Water Quality Criteria) in a unit (*e.g.*, mercury in the creek), reasoning for going forward or not doing so in the ecological risk assessment (ERA) process must be addressed (*e.g.*, if only one sample of a significant number exceeds an EDQL by a limited margin for that media in that unit, that may be justification for not continuing the process for that unit) and presented in a format transparent to the public. The purpose of screening levels is to screen out compounds below those levels, any difference from this process must be clearly documented and justified. In some cases multiple contaminants that may have similar effects exceed EDQLs (*e.g.*, metals or PAHs in sediment samples in Table 4.12). Also, EDQL levels should be adjusted for the presence of multiple chemicals (*e.g.*, divide the EDQLs by the number of PAHs or alternately, sum the ratios of each maximum PAH concentration to its corresponding EDQL and evaluate the resulting sum).
21. Section 4.5.1.1 and Appendix E, Ecological Report. The report attempts to delineate wetlands on-site and in the immediate area, to evaluate the quality of these wetlands using the Ohio Rapid Assessment Method (ORAM), and to document receptors present in these areas. However, the sediments from these areas were not sampled. Some of these areas (*e.g.* to the north and east of cells H & I) have ecological receptors (*i.e.*, frogs, turtles, birds) that not only could be exposed to contamination if present and could expose higher trophic level organisms to persistent, bioaccumulative and toxic (PBT) compounds, but also could serve as an attraction to any trespassers on the site. Given the ability of sediment to act as a sink for contaminants, storing them for long periods of time, proper characterization of this potential exposure pathway is important. Even though these wetlands are not large in area, having complete information regarding the type and amount of any contamination will allow proper assessment of any potential risk

(i.e., higher concentrations of contaminants, if present, and the presence of various prey species could compensate for smaller areas and pose a risk to higher trophic levels).

22. Revise the Phase II Work Plan to state that maps and cross sections showing the full vertical and horizontal extent of contaminant plumes will be included in the Phase II Report. In the Phase II Report plume boundaries shall be defined for areas exceeding risk and areas exceeding background. Risk boundaries and full extent boundaries (nondetect for nonnaturally occurring constituents and statistically above background for naturally occurring constituents) must be supported by well data. This may require the installation, sampling, and analysis of multiple step out wells prior to having sufficient data to complete the Phase II Report. Boundaries off ESOL's property may be supported by modeling (e.g., Modflow/MT3D) if evidence is provided that access to adjacent property has been denied. If access to adjacent property is denied the adjacent property owner needs to be informed of potential liabilities from inhibiting the investigation of the contaminant plumes.

SPECIFIC COMMENTS

1.3 Project Description

1. Pages 2 and 3 list the AOCs and SWMUs considered in the RFI. Although EPA and Ohio EPA have approved SWMUs 2, 3, and 4 and AOC 11 from RFI investigations, the Phase I RFI Report does not provide adequate justification for excluding these SWMUs and AOCs from consideration in the ERA. Appendix E of the RFI indicates that these areas may provide habitat for ecological receptors, and the rationale for excluding these areas from the ERA should be provided in the Work Plan; it is not adequate to simply state that habitat is not present. The specific habitat characteristics of each site should be summarized and their absence of habitat value discussed. The rationale for excluding the wetland areas in SWMU 6 is also not adequately explained in the Phase I Report (e.g., Table 2.2). Table A, below, provides a summary compiled from Table 2.2 of the Phase I Report and identifies concerns with each AOC, SWMU, and Investigation Area (IA). Table A below has been provided to summarize the RFI ecological determinations and EPA's ecological concerns for each area. The Phase II RFI Work Plan should be revised to address each of the "Potential ERA Concerns" listed in Table A below.

Table A. Summary of SWMU and AOC Ecological Risk Concerns ¹				
Area ²	Description	Phase I Habitat Findings	Phase I ERA Screening	Potential ERA Concerns
SWMU 1	Landfill Cell F	no habitat	N soil runoff and GW	*no contaminants on soil analyte list
SWMU 5	Millard Rd Landfill	no habitat	N and W soil runoff and GW; ditch sediment	

SWMU 6	N Sanitary Landfill	wetlands	soil runoff and GW (north side)	*only one soil sample *no screening of wetlands ³ *GW not listed
SWMU 7	Central Sanitary Landfill	no habitat	none	*no screening ⁴
SWMU 10	Ash disposal area	aquatic habitat	see IA C below ⁵	see IA C below ⁵
SWMU 11	Former Teepee Burner	no habitat	none	*no screening ⁴
SWMU 12	Bill's Rd Oil Operation	no habitat	none	*no screening ⁴
AOC 2	Truck Scale	aquatic habitat	see IA C below ⁵	see IA C below ⁵
AOC 6	Oil waste ASTs	no habitat	none	*no screening ⁴
AOC 10	Rail spur	no habitat	none	*no screening ⁴
Investigation Area (IA) A	SWMU 8; AOCs 3, 4, 5, 7, and 8	no habitat	none	*no screening ⁴
IA B	SWMU 9; AOC 1	no habitat	none	*no screening ⁴
IA C	AOC 9; outfalls; Otter Creek	aquatic habitat	*SW or SW and sediment	

1. Derived from Table 2.2 of the Phase I Report. Tables 3A to 3F contain the specific analytical data but these tables could not be located.
2. Only areas investigated in the Phase I RFI are listed in this Table.
3. Table 2.2 states that wetlands are not impacted per "DOCC." Absence of impacts has not been adequately documented in the Phase I Report.
4. Contaminant screening was not performed because the Phase I Report states that no habitat is present. Absence of habitat has not been adequately documented.
5. Potential ecological impacts were investigated only by evaluating outfall samples under the IA C assessment.

1.5 Scope of Phase I RFI Activities

2. Page 6 states that a risk-based approach was used to determine additional investigations and potential interim measures, but an ERA was not performed. As indicated in Section 4.3.2 of the Work Plan, a screening-level ERA was to be performed as part of the Phase I RFI. It is unclear what the scope of the ERA will be and when this will be performed.

2.1.1.3 Hydrogeologic Survey

3. Page 9 introduces Figures 2-1 and 2-2 as the results of the water level survey designed to determine groundwater/surface water interactions. The Phase I RFI Report presents conclusions on potential hydraulic connection between shallow groundwater and Gradel Ditch and Otter Creek. However, the water level

elevations presented in Figures 2-1 and 2-2 are not contoured, which makes review of the hydraulic relationships difficult. The water level elevations in Figures 2-1 and 2-2 should be contoured to more effectively highlight the conclusions presented on Page 9. In addition, the groundwater elevation data should be provided as a separate table in this report and future reports.

2.1.2 Phase I Investigation Overview

4. The Phase I Report should briefly summarize the rationale for the selection of analytes in each SWMU, AOC, or IA or cite the specific section of the Phase I Work Plan where this information is provided. Because the tables only display detected constituents rather than the entire analyte list with the detection limit for those non-detects, it is difficult to determine which samples were analyzed for what chemical classes. Revise the Phase I Report accordingly.

2.1.2.2 Background Sampling

5. Page 12 indicates that soil, groundwater, sediment, and surface water samples were obtained from background locations. However, the Phase I Report does not discuss how or why these locations were selected. Specifically, the text indicates that background soil samples were taken from an area that "has not been used for waste handling activities;" however, given that this area is on site, as illustrated in Figure 2-3, it is unclear whether this area may have been impacted by site related activities via fugitive dust or incinerator deposition. Surface water and sediment background samples were collected "upstream of ESOI's discharge points," but the sample locations are not provided in a figure. Therefore, it is not possible to assess the potential for contaminated groundwater to discharge at locations "upstream" of site-related point sources. The Phase I RFI Report should be revised to include an assessment of whether the background soil sample locations could potentially be impacted by fugitive dust or incinerator deposition. Additionally, an assessment of whether the surface water and sediment sample locations reflect background conditions should be included. The location of the surface water and sediment background samples should be illustrated on a figure and discussed in terms of groundwater flow direction as illustrated in Figures 2-1 and 2-3. Based on these assessments, additional background sampling and analysis may be warranted.

Additionally, ESOI should refer to EPA's latest background guidance entitled, *Guidance for Comparing Background and Chemical Concentrations in Soil for CERCLA Sites*, OSWER Directive 9285.7-41, EPA 540-R-01-003, September 2002. ESOI should provide a discussion on background conditions and whether site concentrations are elevated over naturally occurring levels, to determine whether background concentrations had been impacted by site-related activities. It is suggested that a screening table displaying background concentrations and the screening process be included in the RFI Phase I Report. If a Hazard Index (HI) exceeds one, or the target risk (TR) exceeds a defined goal, then that contaminant should be identified and discussed in the risk assessment.

2.2 Ecological Survey Activities

6. Page 13 and Table 2.2 provide a cryptic summary of the results of the ecological investigation, and Appendix E of the Phase I Report summarizes the approaches and survey results of the qualitative ecological investigation. Table 2.2 states that a number of SWMUs, AOCs, and IAs were not “ecologically relevant,” but documentation of this determination is not provided in the Phase I Report. Neither Table 2.2, the main text of the Phase I Report, or Appendix E provide an area-specific determination and rationale for excluding a specific SWMU, AOC, or IA. Field forms are provided in Appendix E, but ecological relevance is not specifically addressed. It is unclear what criteria, if any, were used in determination of an absence of ‘ecological relevance’ and a determination of no further investigation. Revise the report to provide the specific rationale for determining that any SWMUs, AOCs, and IAs were not ecologically relevant. It is not adequate to only state that habitat was not present.

4.2 Evaluation of Need for Additional Investigation

7. Page 19 states that “ecological risk-based screening levels” and “ecological risk assessment principles” are used to evaluate data and support decisions regarding the need for further field work. The Phase I Report does not present an ERA in accordance with current EPA guidance as discussed below. Specific concerns include only considering detected compounds, excluding compounds based on background comparisons, not considering areas of potential habitat, not performing an ERA uncertainty analysis, and not considering the magnitude or spatial extent of ecological risks. Page 4-13 of the Phase I Work Plan stated that a screening ERA will be conducted according to the current EPA guidance, including the 1997 EPA Guidance. A screening ERA was not presented in the Phase I RFI Report, in apparent conflict with the Phase I Work Plan. The 1997 EPA Guidance and EPA guidance issued in 2001, *The Role of Screening-Level Risk Assessments and Refining Contaminants of Concern in Baseline Ecological Risk Assessments* (2001 EPA Guidance), provide the specific requirements for identifying contaminants of potential concern (COPCs) in a screening-level ERA. Revise the Phase I Report to provide a screening ERA in accordance with the 1997 EPA Guidance and 2001 EPA Guidance and as specified in the Phase I Work Plan.

4.2.2.2 Quantitative Comparison to Human Health-Based Screening Levels

8. Pages 23 and 24 identify the screening criteria used to evaluate media-specific concentrations. It is unclear whether all analytes were evaluated using the screening criteria, or only those constituents with actual detected concentrations. Because the tables only list detected constituents, it is difficult to interpret whether all analytes were evaluated using the screening criteria. Thus, the Phase I Report should also include (1) a summary of the comparison of detection limits to risk-based screening concentrations, and (2) a discussion and interpretation of the screening results. It is not adequate to only indicate that detected concentrations

were screened using screening criteria without providing additional discussion on detection limits and the non-detected contaminants.

9. The soil screening procedures outlined in the Phase I Report differ from those in the approved Phase I Work Plan. Specifically, the Phase I Work Plan outlines a screening procedure that evaluates sampling data using the risk-based screening criteria based on a target cancer risk of 10^{-6} . However, page 24 of the Phase I Report identifies a second level segregation screening procedure, which evaluates sampling data using risk-based screening criteria based on a target cancer risk of 10^{-5} . EPA's acceptable risk range is 10^{-4} to 10^{-6} ; however, the impact of screening potential contaminants based on a 10^{-5} rather than a 10^{-6} target cancer risk may result in cumulative impacts in the upper end of the risk range. For example, if more than ten contaminants exceed the risk-based screening criteria based on 10^{-5} , cumulative risks may fall into and far exceed a cumulative risk of 10^{-4} . Thus, screening using a cumulative target risk of 10^{-5} is not sufficiently conservative.

Additionally, the Region 5 RCRA program considers the Region 5 states' requirements and strives to achieve consistency with the Region 5 states target risk limits for remedial decisions. Specifically, Ohio EPA has indicated in its *Closure Plan Review Guidance for RCRA Facilities: Part II: Guidance for Reviewing Risk-Based Closure Plans for RCRA Units* (March 1999) that cumulative cancer risk may not exceed 10^{-5} . Consequently, the risk screening for no further action at a cumulative risk level of 10^{-4} is not sufficiently conservative and should be reduced to a target cancer risk level of 10^{-5} . The Phase I Report should be revised to address these concerns.

10. It does not appear that the inhalation of volatiles emanating from groundwater or soil into indoor air was considered in the screening process. Vapor intrusion has been identified in the CSM as a potential exposure pathway, but none of the risk-based screening criteria used to evaluate concentrations of detected contaminants include this as a potential exposure pathway. Although this pathway was not addressed in the Phase I Work Plan, it should be discussed in detail in the Phase I Report and incorporated into the Phase II Work Plan. At a minimum, concentrations in groundwater and indoor air should be evaluated for the potential to migrate via vapor intrusion. Using the November 2002 Draft Guidance entitled *Evaluating the Vapor Intrusion into Indoor Air* (EPA 2002), ESOI should perform the Tier 1 and Tier 2 screening recommended in the guidance to assess whether additional data gathering is necessary to determine if this exposure pathway is complete.

4.2.2.3 Quantitative Comparison to Ecological-Based Screening Levels

11. Page 28 lists the "screening criteria" used to evaluate media concentrations. Page 28 notes that surface water results will be compared to ecological screening levels (EDQLs) "for aquatic life." In contrast, the EDQLs referenced in the Phase I Report do not specify aquatic life, but rather are listed by media (e.g., surface

water). The Phase I Work Plan (p. 4-3) specifies that surface water EDQLs will be used, not aquatic life EDQLs. It is unclear if the correct EDQLs have been used in the Phase I Report because EDQLs based on wildlife risks may be substantially lower than those determined only for the protection of aquatic life (see August 22, 2003 update of EPA's 1999 guidance, *Ecological Screening Levels for RCRA Appendix IX Hazardous Constituents*). Of additional note, the soil and sediment screening values are ecotoxicity benchmarks or screening values and should not be referred to as "criteria" in this section or elsewhere in the Phase I Report.

4.4 Preliminary Cumulative Risk for Human Health

12. The Phase I RFI Work Plan indicates that exposure concentrations estimated from the analytical data will be used to estimate site-related cancer and noncancer risks in the human health baseline risk assessment (HHRA). Section 4.4 of the Phase I Report only includes estimates of cumulative cancer risk (CR) and noncancer HI for potential exposures to industrial workers, but does not include a comprehensive HHRA which evaluates risks to potential receptors under current and potential future land use conditions. It is not clear whether a comprehensive baseline HHRA will be performed once investigations are complete and will be included as part of the Phase II RFI Report. The Phase I Report should include a discussion of the intent of providing preliminary cumulative risk estimates and should qualify that these results are preliminary and precede a full baseline risk assessment.
13. Page 103 presents upper bound estimates of cumulative CR and noncancer HI for potential exposures to industrial workers. The text indicates that the maximum detected concentrations were used in conjunction with EPA Region 9 preliminary remediation goal (PRG) default values to derive estimates of risk. The text also states that these are upper bound estimates because maximum concentrations were used and that actual estimates would be lower if site-specific exposure factors were applied. The Phase I Report does not include site-specific exposure factors, nor does it discuss the differences between the Region 9 PRG default values and proposed site specific parameters. Thus, the statement that this is an upper bound estimate is unsupported and misleading. The Phase I Report should be revised to include either site-specific exposure parameters and cumulative risk calculations under a reasonable maximum exposure (RME) scenario as described in the Phase I Work Plan or include a discussion regarding the difference between site-specific parameters and Region 9 PRGs and how the Region 9 PRGs provide conservative upper bound estimates of risk at the site.
14. It is not clear whether the cumulative risk estimates were derived using the maximum concentration of all detected contaminants, or only those detected contaminants with concentrations exceeding screening criteria. As discussed in Specific Comment 8, the Phase I Report does not indicate whether the detection limits for those non-detected contaminants were evaluated using the screening criteria or whether non-detects were completely eliminated from further

evaluation. This could significantly impact cumulative CR and HI risk estimates and should be discussed in the Phase I Report. The Phase I Report should be revised to address this issue.

15. The Phase I Report does not present estimates of risk for exposure to other media, including groundwater, surface water, and sediment. If the intent of the Phase I Report is to determine whether sampling is adequate and assess or present information on the human health risks, a detailed discussion of the results from sampling each medium should be included in the report. The Phase I Report should be revised to address this issue.

4.5.1.4 Important Ecological Resources

16. Pages 107 to 108 state that there is an absence of important ecological resources at multiple areas of the site. However, the rationale, process, and specific data used to determine such an absence is not provided in the Phase I Report. Appendix E.1 of the Phase I Work Plan states that an absence of habitat would be verified in the Phase I investigation. There is no information on how this verification was performed, nor is there a reference to where the area-specific verification results are presented. The Phase I Report should be revised to include the rationale and specific ecological information used to determine that an area did not have "ecological relevance." For example, it is not clear how it was determined that bald eagles would not feed on prey exposed to contaminants in the excluded areas (p. 7 of Appendix E states that the site is within the range of bald eagles).

4.5.2.1 Ecotoxicological Benchmark Values

17. Pages 108 to 110 describe the ecological screening values used in assessing concentrations of chemicals in RFI samples. The initial screening results were presented in Tables 4.9 to 4.15 using screening values that considered the potential for wildlife risks for most detected chemicals. Appendix I of the Phase I Report then presented a re-screening of COPCs identified in the initial screening to, "assess the potential ecological significance of the concentrations." The re-screening was not performed appropriately because none of the selected additional screening values appear to consider wildlife risks; i.e., all of the selected benchmarks are only based on direct toxicity to aquatic organisms, plants, and soil invertebrates. It is unclear how "ecological significance" can be evaluated when wildlife risks are not considered in the selected benchmarks. It is also unclear what decision criteria were used in deciding if a benchmark exceedence was "ecologically significant." The Phase I Report should be revised to address these concerns.
18. The ecological screening tables in both the main text (Tables 4.9 to 4.15) and Appendix I assess detected analytes. The Phase I Report should also include (1) a summary of the comparison of detection limits to EDQLs or other benchmarks that consider toxicity to both community receptors and to wildlife, and (2) a

discussion and interpretation of the screening results. It is not adequate to only refer the reader to multiple complex tables without discussing the rationale for considering a compound a COPC and for determining the need for additional investigation. Both the Phase I Work Plan and Report state that professional judgement was a major component in the decision process. This professional judgement should be made clear in the Phase I Report. The Phase I Report should also briefly summarize the rationale for the selection of analytes in each SWMU, AOC, or IA or cite the specific section of the Phase I Work Plan where this information is provided. The Phase I Report should be revised accordingly.

4.5.2.2 Potential Exposure Pathways and Ecological Receptors

19. Pages 110 to 111 make broad generalizations regarding the quality of ecological habitat that do not appear consistent with the results of the Appendix E Ecological Report. The Ecological Report indicates that a diversity of species may utilize site habitat and species with life stage characteristics that may provide high exposures are present (e.g., shrews, robins, amphibians, sandpipers, herons). Specific concerns include:

- The Phase I Report's conclusion (p. 111), states that the only potentially complete exposure pathway for soil and sediment is prey ingestion, is not adequately supported. Community receptors (e.g., benthic and soil invertebrates, aquatic and terrestrial plants) are likely to be exposed to surficial soil and sediment. Wildlife may also be exposed to soil and sediment through incidental ingestion during foraging and preening (Beyer et al., 1994).
- The Phase I Report's statement (p. 111) that there are no aquatic ecological receptors in the retention basins or drainage ditches is not consistent with the Appendix E Ecological Report. Page 13 of the Ecological Report cites an Ohio EPA report that the Driftmeyer Ditch contained fish. It is highly likely that any ditches with standing or flowing water contain benthic and water column invertebrates, which are aquatic community receptors.

The Phase I Report should ensure consistency and accuracy throughout the report. Inaccurate statements regarding the presence or absence of ecological receptors should be removed. If a determination of an absence of potential ecological exposures is made based on the relatively narrow habitat definitions presented in the Phase I Work Plan (pp. 3-48 and 3-49) then this should be clearly stated. As noted above, the criteria, procedures, and information used to verify an absence of habitat must be presented for each specific area. This has not been adequately presented in the Phase I Report. The Phase I Report should be revised to address these concerns.

4.5.3 Chemicals of Potential Ecological Concern

20. Pages 111 to 113 summarize the identification of COPCs, and refer the reader to Appendix H. Appendix H of the Phase I Report is an evaluation of background soil data. Appendix I presents ecological screening results using multiple benchmarks, and does not clearly identify the COPCs. The Phase I Report should be revised to clarify and provide the rationale for COPC selection.
21. The process used to identify ecological COPCs in the Phase I RFI Report is not consistent with current EPA guidance (EPA, 1997, 1998, 2001). Of additional concern, the Phase I RFI Report does not present a screening ERA, which is not consistent with the Phase I Work Plan. Instead, the Phase I Report presents a screening of site samples through a comparison to a variety of ecotoxicity benchmarks and to site-specific background levels. Background screening is not allowed in a screening ERA according to the 1997 EPA Guidance and 2001 EPA Guidance, and the presentation of ratios of sample concentrations to benchmarks does not constitute an ERA. Specific aspects of the screening ERA that are missing from the Phase I Report include problem formulation, analysis of exposure and effects, risk characterization, and uncertainty analysis. It is unclear if an ERA will be performed after the Phase II sampling is completed, but additional investigation may be needed beyond the currently proposed work if ecological risks are present. The current process of identifying COPCs is not adequate and the identification of ecological COPCs should be repeated using a screening process that is in accordance with current EPA guidance and that addresses the issue identified in this technical review. The Phase I Report should be revised to address these concerns.

4.5.4 Sampling Recommendations for Ecological Evaluation

22. Pages 113 to 115 briefly summarize the conclusions regarding additional sampling needed on site and at Otter Creek. These conclusions are not adequately supported because the Phase I Report has not adequately documented the absence of on-site habitats, and the COPC identification was not performed in accordance with the 1997 EPA Guidance and 2001 EPA Guidance. The Phase I Report should be revised to address these concerns.
23. Section 2.1.1.3, Page 9, Paragraph 2. The text states that there is no demonstrated direct connection between shallow ground water and the adjacent Gradel Ditch north of the facility.

Figure 2-1 displays the bottom elevation of Gradel Ditch to be 583.44 ft. above mean sea level (amsl). The fluid level elevation in lacustrine/upper till wells F-2S, SW-1S, and SW-2S are at times above the bottom elevation of Gradel Ditch (i.e. April 2002 F-2S = 585.44 ft. amsl; SW-1S = 586.23 ft. amsl; SW-2S = 585.85 ft. amsl, ESOI October 2002). This indicates that at times the shallow ground water and lacustrine/upper till ground water are discharging to Gradel Ditch. During dry periods fluid levels may be too low or the rate of discharge may not exceed the rate of evaporation and vegetative uptake and the hydraulic head pressure may not exceed the capillary absorption capability of the soil. Shallow ground waters usually have some flow component towards ground surfaces or

surface water bodies with lower elevations.

Contaminants found in shallow ground water must be shown to be of concentrations less than surface water criteria (as defined in Section 4.2, Page 4-3, Bullet 4 of the RFI Work Plan dated February 28, 2002) before they reach their point of discharge to the ground surface or surface water body. In addition to wells next to Gradel Ditch, all water table wells, lacustrine/upper till wells and waterline trenches that are pumped and discharged to the ground surface need to be evaluated comparing analysis results to risk-based surface water criteria (as defined in Section 4.2, Page 4-3, Bullet 4 of the RFI Work Plan dated February 28, 2002). Some of the potential shallow ground water discharge points include the following:

- i. Ditch along the north side of Millard Avenue Landfill (SWMU 5);
- ii. Ditch along the east side of SWMU 5;
- iii. Ditch along the south side of SWMU 5;
- iv. Ditch along west side of Cell F (SWMU 1);
- v. Low area east of the North Sanitary Landfill (SWMU 6);
- vi. Stormwater ponds at Cell H (SWMU 3) and Cell I (SWMU 4);
- vii. The storm sewer that discharges to Otter Creek and runs along the south side of the Old Oil Pond (SWMU 8) and Butz Crock (AOC 7); and
- viii. Waterline trenches (AOC 1) that are pumped and discharged to the ground surface.

Phase I analysis results for water table wells and lacustrine/upper till wells and monitoring/dewatering trenches that are pumped and discharged to the ground surface shall be re-evaluated comparing the results to risk-based limits for discharges to surface water (as defined in Section 4.2, Page 4-3, Bullet 4 of the RFI Work Plan dated February 28, 2003). The RFI Phase I Report shall also be revised to include a table of discharge to surface water screening criteria for all Phase I constituents.

In addition to the above referenced text section, Section 4.3.3.3, Page 49 shall be revised to identify Gradel Ditch as a point of ground water discharge to surface water.

24. Section 2.1.2, Page 10, Paragraph 1. ESOI indicates that all samples collected for the purpose of determining if a release occurred were analyzed for "all VOCs, SVOCs, PCBs, herbicides, pesticides, and inorganics listed..." It appears samples collected in the stained soil area west of the Millard Avenue Landfill (SWMU 5) were not analyzed for all these parameters. Given the staining in the area, apparently emanating from the landfill, and that this area is potentially hydraulically connected with Otter Creek, it is imperative that this potential release be fully characterized. Regardless of whether similar contaminants are found upstream, any contribution from ESOI should be fully characterized and abated, if necessary. ESOI remains responsible for any ongoing and historic contamination from its site.
25. Section 2.1.2, Page 10, Paragraph 1. ESOI indicates that all samples collected for the purpose of determining if a release occurred were analyzed for "all VOCs, SVOCs, PCBs, herbicides, pesticides, and inorganics listed..." There are several additional sampling parameters identified on Table 3-2 of the RFI Work Plan, some of which have not been identified in the RFI Phase I Report data summary tables (i.e., Inorganic, geochemical parameters and soil property parameters). ESOI shall revise the RFI Phase I Report to clearly identify which locations were selected to have additional sampling

parameters analyzed for and the significance of those results to the Phase II Work Plan.

26. Section 2.1.2.1, Page 11, Bullet 2. The text states total thallium results at wells H-3D, H-3S, I-5SA and total antimony results at wells I-3D, I-5SA, I-7S, H-3S exceeded the maximum contaminant level (MCL). The text states that any further work regarding thallium and antimony, if necessary, will be addressed under ESOI's routine ground water monitoring program.

The baseline risk assessment must include all elevated constituents in the evaluation. The RFI Phase I Report does not define background for inorganics nor has the routine ground water monitoring program completed this determination. The RFI Phase I Report must be revised to define background and identify all elevated constituents. The Phase II Work Plan must be revised to include the determination of the full extent of all elevated constituent plumes.

27. Section 2.1.2.2, Page 12, Bullet 2. Section 2.1.2.2, Page 12, Bullet 2. The text states that three background wells were installed and sampled (BG-1S, BG-1D, and BR-1R) and existing wells M-13S, M-13D, M-2S, MD-2D and R-11 were sampled for background water quality.

The Phase I Work Plan does not state that existing wells M-13S, M-13D, M-2S, MD-2D and R-11 will be used to collect background data. Furthermore the Phase I Report does not include an evaluation of the data from these wells as to whether the data is representative of background. In addition, fluid level measurements taken during the April 2003 sampling event at background bedrock well (BGR-1) indicates that the selected background wells may not be upgradient. The fluid level data indicates that there may be a well to the southeast withdrawing water creating a cone of depression southeast of the facility. This makes the discussion or justification that the data is representative of background conditions even more of a necessity.

The Phase II investigation shall include an investigation to determine whether there are ground water production wells located southeast of the facility, a determination of ground water flow direction, and include an evaluation of background data as to whether it is representative of background.

28. Section 3.2.2, Page 15, Paragraph 1. ESOI states that "Accuracy is the degree of agreement between an observed value and an accepted reference value. Field accuracy was assessed through the regular calibration of field instruments and through the collection of field and trip blanks." It is not clear how this assessment was done as the report only indicates that instruments were calibrated and field and trip blanks were collected, not how they were assessed and against what criteria. ESOI shall revise the Phase I report to clearly describe how field accuracy was assessed based on calibration of instruments and the results of field and trip blanks.

In addition, ESOI states that "Laboratory accuracy was assessed through the analysis of matrix spike and method spike samples." ESOI shall revise the Phase I Report to define method spike samples. When problems are found with Matrix Spike samples (and duplicates), usually Laboratory Control Samples are evaluated in conjunction to see if the target compounds can be recovered under "ideal" conditions with a clean matrix. Was this done here? ESOI shall revise the Phase I Report to include the results

of such overall QA/QC analyses.

29. Section 3.2.2.2, Page 16. ESOI indicates that laboratory accuracy will be assessed using MS/MSD samples. Section 3.2.2.2 goes on to say, "...the criteria for acceptance of these results were listed in Table 3.1 of the QAPP." Table 3.1 does not list such criteria but further down in the text it says, "Values for % R are expected to be within three standard deviations of the average. These ranges are updated on an annual basis. Values outside this range indicate procedural problems that may adversely affect the accuracy of the determination. A recovery of 80 -120% will be used as a guidance for low volume analyses that do not create sufficient data points (20 or more per year)."

It is not clear what this means and how it demonstrates meeting the criteria. How is three standard deviations applied or applicable to varied environmental samples - from different hazardous waste units spread across a large site. Or if the +20% criterion for low volume analyses is used, what is the outcome if results are outside those limits? Are these limits also met for soils and sediment samples? Present data to verify these criteria were met (e.g., summary tables of QA/QC results with analysis of how criteria were attained). Provide a source for this approach.

30. Section 3.2.4, Page 17, Paragraph 1. It is not clear where the 90% completeness goal was derived from or how it was implemented. Explain exactly what this goal means and how it was measured. Upon completion of all sample assessment (including Data Validation) the Data Quality Objective of completeness should be evaluated by unit - not overall for the site. The sample assessment should include the number of samples associated with a SWMU or AOC that are affected by qualification, the degree of qualification (*i.e.*, "J" or "R"), etc. It should also evaluate if any of the not complete data is critical (e.g., for determining extent, documenting concentrations of important/risk-driving compounds, *etc.*) and whether it should be replaced.
31. Section 3.2.4, Page 18, Table. It is not clear if the samples identified in Appendix A, Table 1-3 of the RFI Work Plan were completed. Revise the table on Page 18 to be similar in appearance to Table 1-3 in Appendix A of the RFI Work Plan so that a direct comparison can be made.
32. Section 3.2.4, Page 18, Paragraph 1. ESOI indicates that 66% of the acetonitrile data is complete because acetonitrile was a recurring contaminant in blanks (Sample Delivery Groups 11, 15, 18, etc.). Has this compound been detected in previous sampling events at ESOI? It was detected in RFI sediment samples above ecological screening levels. It also appears to have been detected in soil samples including S-F20C7P1-091602-NAB-187 (SDG 19). Any detections of this possible contaminant should be discussed in terms of a comparison to the concentration in the associated blank sample. Often a '10X rule' is used. For example, a detection is considered to be valid if it exceeds 10 times the level of contaminant in the blank. Also, the data validation summary for SDG 15 (dated February 28, 2003) refers to Section IX, Item 8 in the Case Narrative for further explanation. This item does not appear to be in the RFI report. ESOI shall revise the Phase I Report to include the Case Narrative that is referenced and a discussion of the detection of possible contaminants in terms of a comparison to the concentration in the associated blank.
33. Section 4.2, Page 20, Paragraph 1. This section indicates that a streamlined approach for review of the data will involve segregating data that indicates "a higher potential for

human health or ecological significance...from those that indicate a low potential." This section further indicates that, "decisions regarding the need for further investigation will be made based on professional judgement considering the screening results and results of the qualitative review." The rationale for this approach is not well defined. Results of such a review must be completely transparent to explain to the public why exceedances of "appropriate, conservative human health and ecological risk-based screening levels" using "current and reasonably expected future land uses" do not require some action. The segregated data should be clearly linked with the explanations regarding why exceedances of screening data do not require additional sampling or remediation in the associated unit.

34. Section 4.2.1, Page 21, Bullet 1. The report indicates that ESOI will assess if Non-Aqueous Phase Liquids (NAPLs) are likely to be present but does not specify how ESOI is assessing "unusually high constituent concentrations, which may indicate the presence of nonaqueous-phase liquids." In ground water, levels that are below the water solubility maximum can indicate the possible presence of NAPL. Or for soils, values below the calculated soil saturation limit (U.S. EPA 1996b) can indicate the possible presence of NAPL. Various Rules of Thumb have been established for what level should be used to conservatively assess the possible presence of NAPL (which would typically require additional sampling to verify its presence or absence). For example ITRC (1999) and U.S. EPA (1992) have used detection of potential NAPLs in ground water at greater than 1% of their maximum solubility as an indicator that NAPL may be present. ESOI shall revise the Phase I Report to provide a rationale and reference(s) for the method(s) used to evaluate the possible presence of NAPL at this site, an evaluation of any places NAPL may be present, and an explanation of how they will be further evaluated (e.g., additional sampling).
35. Section 4.2.2.2, Page 24, Bullet 1. ESOI derived "soil leaching to potable ground water" criteria "using the procedure outlined in USEPA's Soil Screening Guidance (USEPA 1996b) and the USEPA's default dilution attenuation factor (DAF) of 20, and as such, the calculations are not repeated here." ESOI's derived criteria should be reproducible. Therefore, provide the input values (in table format) used to derive the soil leaching to potable ground water criteria. Also, a review of the leaching to ground water comparison standards raises the following concerns.
 - i. The conditions at ESOI's Otter Creek facility do not meet the default criteria described in U.S. EPA's soil screening guidance (i.e., the guidance assumes a 0.5 acre source area) (EPA540/R-96/018, July 1996c).
 - ii. ESOI does not substantiate its statement on page 24 that "site-specific input parameters would result in higher DAF values." Provide an explanation for using a 20 DAF or revise the calculations using a 1 DAF.
 - iii. It is assumed that ESOI used Equation 10: Soil Screening Level Partitioning Equation for Migration to Ground Water (EPA540/R-96/018, July 1996c). This calculation assumes that no NAPLs are present and if NAPLs are present, the SSLs do not apply. ESOI may not use SSLs where NAPLs were identified in the Phase I investigation.
 - iv. A comparison of U.S. EPA's generic SSLs for migration to ground water

using 20 DAF (EPA/540/R95/128. July 1996b) to ESOI's derived standards reveals that ESOI's derived standards are, in some cases, orders of magnitude less conservative. For example, ESOI's standard for benzene is 2.0 mg/kg. U.S. EPA recommends a standard of 0.03 mg/kg for benzene. ESOI's standard for 1,1-dichloroethane is 1,500 mg/kg. U.S. EPA recommends a standard of 23 mg/kg for 1,1-dichloroethane.

Therefore, develop a site specific leaching to ground water screening criteria, using the generic SSLs (migration to ground water, 1 DAF) from Table A-1 (EPA/540/R95/128. July 1996b), or provide a justification for using the generic SSLs calculated using 20 DAF. Developing a site specific comparison standard includes developing a site-specific DAF and collecting site-specific soil parameters (such as the dry bulk density and percent soil moisture). After choosing an option, revise the RFI Phase I Report and Recommendations for Phase II Investigation to reflect the new standards and any additional findings based on the new leaching to ground water comparison standards.

36. Section 4.2.2.2, Page 24, Paragraph 1. Successive levels of data screening was not approved in the RFI Work Plan (ESOI 2002) and may not be used. Revise the RFI Phase I Report to reflect the approved soil screening methodology.
37. Section 4.2.2.2, Page 24, Paragraph 2. U.S. EPA approved Region 9 Industrial Preliminary Remediation Goals (PRG) (USEPA 2002) for soil screening. Region 9 PRGs are chemical concentrations that correspond to a fixed level of risk. The fixed level of risk for cancer is $10E-6$. This screening target cancer risk is also supported by U.S. EPA in the May 1996 Federal Register (61 FR 19432, May 1, 1996a). Using $10E-5$ as a screening level is not acceptable, particularly with multiple chemicals present. Revise the Phase I RFI Report and Phase II Work Plan to reflect the use of PRGs calculated with a target cancer risk level of $10E-6$.

Additionally, using an Hazard Quotient (HQ) of 1 is not appropriate. Using an HQ of 1 does not account for the presence of multiple chemicals. To address this, the October 2002 PRG guidance states that "if the risk-based PRG is set at a $HQ = 1$, and the user would like to set the HQ to 0.1 to take into account multiple chemicals, then this is as simple as multiplying the risk-based PRG by $1/10th$." Screening is a conservative step and screening levels must reflect that approach. Revise the Phase I RFI Report and Phase II Work Plan to reflect the use of an HQ of 0.1.

38. Section 4.2.2.2, Page 25, Paragraph 2, and Supplemental RFI Pages regarding EDWLs (DeLussa 2003). When assessing worker exposure by unit, risk assessment procedures must sum risks from different units when the task is similar and it can reasonably be assumed the same worker might be doing work at multiple units (e.g., maintenance). If a maintenance/construction worker scenario is used to calculate risk levels for screening chemicals, a multiple unit/day exposure may also be appropriate (depending on if the chemical is present in samples from multiple units). Compounds should not be screened out based on exposure assessment for one unit when these compounds are also present elsewhere on the site.
39. Section 4.2.2.2, Page 26, Bullet 1 and Supplemental RFI Pages regarding EDWLs (DeLussa 2003). ESOI states that "For chemicals without MCLs, the risk-based EDWLs are calculated using EPA standard default exposure factors for residential drinking water

consumption (i.e., 2 L/day, 350 days/year, 30 years, and 70 kg body weight; US EPA 1991a), US EPA-derived oral reference doses (RfDs) and cancer slope factors (SFs), and a target cancer risk of 10^{-5} and a target HQ of 1. A summary of the drinking water screening values is provided on Table 1"

The RFI Phase I Report does not contain Table 1 and it does not describe how the EDWLs were calculated.

For chemicals without MCLs ESOI shall use the following equations (Ohio EPA 1999) to derive Equivalent Drinking Water Levels (EDWL). For the noncancer intake equation ESOI shall calculate both adult and child exposures and use the most conservative value, of the two, for the EDWL.

$$\text{Noncancer: Intake (mg/kg-d)} = \frac{CW \times IR \times EF \times ED}{(AT \times BW)}$$

$$\text{Cancer: Intake (mg/kg-d)} = \frac{CW \times \left[\frac{ED_c \times IR_c}{BW_c} + \frac{(ED_a - ED_c) \times IR_a}{BW_a} \right] \times EF}{AT}$$

Exposure Parameters		Units	Value
CW	Concentration in Water	mg/l	Exposure Point Concentration
IR	Ingestion Rate	l/day	1 (child) 2 (adult)
EF	Exposure Frequency	days/yr	350
ED	Exposure Duration	yrs	6 (child) 30 (adult)
BW	Body Weight	kg	15 (child) 70 (adult)
AT	Averaging Time	days	2,190 (child - noncancer) 10,950 (adult - noncancer) 25,550 (cancer)

In addition, ESOI's EDWLs must be reproducible. To facilitate the review of ESOI's EDWLs, revise the RFI Phase I Report to include a table of the US EPA-derived oral reference doses (RfDs) and cancer slope factors (SFs) used to derive the EDWLs. The RfDs and SFs shall be the most current available US EPA-derived oral toxicity factors as stated on Page 4-3 of the RFI Work Plan.

Finally, since the EDWLs are being used for screening criteria, to account for additive risk, ESOI must calculate the EDWLs using a target cancer risk of $10E-6$ [excess lifetime cancer risk = chronic daily intake (CDI) x slope factor (SF)] and a target hazard

quotient (HQ) of 0.1 [HQ = CDI/reference dose (RfD)]. Conservative screening is necessary to assure the full extent of areas exceeding the baseline risk assessment goal of 10E-5 have been defined.

Revise the following additional text sections, tables, and figures accordingly:

- i. Section 4.3.1.4, Page 33, Bullets 3, & 4;
- ii. Section 4.3.1.4, Page 34, Bullet 1;
- iii. Section 4.3.2.4, Page 41, Bullet 4;
- iv. Section 4.3.2.4, Page 42, Bullet 2;
- v. Section 4.3.2.3, Page 43, Bullet 2;
- vi. Section 4.3.3.4, Page 52, Bullet 1;
- vii. Section 4.3.3.4, Page 53, Bullet 2;
- viii. Section 4.3.4.4, Page 60, Bullet 2;
- ix. Section 4.3.5.4, Page 68, Bullet 2;
- x. Section 4.3.5.4, Page 69, Bullet 1;
- xi. Section 4.3.7.4, Page 72;
- xii. Section 4.3.11.4, Page 84, Bullet 3;
- xiii. Section 4.3.11.4, Page 84, Bullet 4;
- xiv. Section 4.3.12.4, Page 95, Bullet 2;
- xv. Section 4.3.12.4, Page 95, Bullet 4;
- xvi. Table 1, which is not listed in the Table of Contents and is not in the Report but is referenced in the text, Section 4.2.2.2, Page 26, Bullet 1 (Table 1 shall be included in the report);
- xvii. Tables 4.4a; 4.4b; and
- xviii. Figures 4.1-1; 4.1-2; 4.2-1; 4.2-2; 4.3-1; 4.3-2; 4.4-1; 4.4-2; 4.5-1; 4.5-2; 4.6-1; and 4.6-2.

40. Section 4.2.2.2, Page 26, Bullet 2. The risk-based screening criteria for shallow nonpotable ground water does not include risk-based concentrations protective of inhalation of vapors from ground water by future building occupants (vapor intrusion).

The *RCRA Facility Investigation Work Plan*, Volume 2, Appendix E, Page 1 includes this exposure pathway. The RFI Phase I Report shall be revised to include screening criteria for exposure to vapor intrusion into buildings. Sampling locations where Phase I analysis results exceed either the risk-based dermal exposure criteria or the vapor intrusion exposure criteria shall be maintained for further investigation to determine the extent of exposure for both pathways.

The following additional text sections, tables, and figures will need to be revised accordingly:

- i. Section 4.3.1.4, Page 33, Bullet 3;
- ii. Section 4.3.1.4, Page 33, Bullet 5;
- iii. Section 4.3.2.4, Page 42, Bullet 1;
- iv. Section 4.3.2.4, Page 43, Bullet 1;
- v. Section 4.3.3.4, Page 53, Bullet 1;
- vi. Section 4.3.4.4, Page 60, Bullet 1;
- vii. Section 4.3.4.4, Page 61, Bullet 1;
- viii. Section 4.3.5.4, Page 68, Bullet 3;
- ix. Section 4.3.7.4, Page 72;

- x. Section 4.3.11.4, Page 86, Bullet 1;
- xi. Section 4.3.12.4, Page 95, Bullet 3;
- xii. Table 4.4b; and
- xiii. Figures 4.1-1; 4.1-2; 4.2-1; 4.2-2; 4.3-1; 4.3-2; 4.4-1; 4.4-2; 4.5-1; 4.5-2; 4.6-1; and 4.6-2.

41. Section 4.2.2.2, Page 26. The Ground water evaluation discussed on this page leaves out the screening criteria for shallow nonpotable ground water near a surface water body.

In accordance with the Phase I Work Plan, Section 4.2, Page 4-3, bullet 4, shallow nonpotable ground water near a surface water body and any identified ground water discharges or seeps to surface water or wetlands are to be evaluated using Ohio Water Quality Criteria applicable to the designated classification of the surface water body (as defined in Section 4.2, Page 4-3, Bullet 4 of the RFI Work Plan dated February 28, 2002).

The RFI Phase I Report shall be revised to maintain all areas for further investigation that exceed the screening criteria for discharges to surface waters. This means that all areas where shallow ground water discharge to surface water at concentrations exceeding surface water criteria (as defined in Section 4.2, Page 4-3, Bullet 4 of the RFI Work Plan dated February 28, 2002) must be maintained for further investigation even if they do not exceed the dermal exposure and vapor intrusion exposure risk based criteria.

42. Section 4.2.2.2, Page 27, Paragraph 1. The text states "Chemicals with at least one concentration that exceeds drinking water criteria at any AOI [Area of Interest] are selected for display on data-box figures to show their spatial distribution across the facility."

Constituents were screened out that were at the drinking water criteria and/or were historically above the drinking water criteria. Constituents that were not above drinking water criteria during the April 2002 sampling event but have been above the criteria in the past should not be screened out. Historical results above the criteria are an indication that a plume above the criteria may be present further downgradient. The extent of the historical levels has not previously been determined and should therefore be conducted during Phase II. The extent of these plumes were not included in Phase I because ESOI stated that they first wanted to determine the width of the plumes and the extent would be determined during Phase II. Constituents that have been historically above drinking water criteria since January 2000, are listed in the table below.

The RFI Phase I Report and Phase II Work Plan shall be revised to identify historical ground water analysis results that exceed drinking water criteria. Phase II shall include additional wells to investigate the vertical and horizontal extent of the plumes identified by the historical ground water analysis data.

Historic Concentrations of Constituents in ESOI Monitoring Wells Above Drinking Water Criteria										
Well ID	Parameter	MCL / PRG* µg/l	Sampling Event and Concentration in µg/l							
			Jan. 2000	July 2000	Oct. 2000	Apr. 2001	Oct. 2001	Apr. 2002	Oct. 2002	Apr. 2003
F-2S	Chloroethane	4.6		11.9	8.1	6.2	8.6			8.38
	1,1-Dichloroethane	8.1		21.7 & 17.4	16.5	15.7	16.8	13.2	8.8	
	1,2-Dichloroethane	5.0		8.2	5.1	5.0	6.1	5.0	5.3	
	Tetrahydrofuran	1.6		2.6			5.5	2.9	9.9	
MR-2D	Benzene	5.0	6.4		5.9					
	1,4-Dioxane	61.0*		185	240	178	159	180	194	141
	Tetrahydrofuran	1.6	11.3	4.7	7.4	4.8	3.1	9.3	7.2	11.8
MR-3D	1,4-Dioxane	61.0*	70.2		98	70.6		72.6		61.3
MR-2S	1,4-Dioxane	61.0*	186	150	405	188	246	184	210	159
	Tetrahydrofuran	1.6	2.4 & 4.3		5.3	2.2	3.5	5.1	2.1	
SW-3D	Tetrahydrofuran	1.6	1.6							
SW-1S	1,4-Dioxane	61.0*	764	1,830	1,760	1,475	1,010	1,260	1,390	1,080
SW-2S	1,4-Dioxane	61.0*	537	918	849		810	798	629	882
H-1S	Tetrahydrofuran	1.6	2.9 & 10.6	151	32.5					

1) Only results above MCL/PRGs are listed. 2)*PRG = Region IX PRG for tap water except for the value for 1,4-Dioxane. The value for 1,4-Dioxane is ESOI's calculated EDWL, which must be recalculated as described in a previous comment.

43. Section 4.2.2.2, Page 27, Paragraph 2. The text states that in the second step of screening shallow ground water, data are compared to criteria for dermal exposure to constituents during excavations. This step screens out shallow ground water data that does not exceed the dermal contact risk-based number.

The second step should only screen shallow ground water data further if it does not exceed any of the following three risk-based exposure criteria:

1. Surface water criteria (as defined in Section 4.2, Page 4-3, Bullet 4 of the RFI Work Plan dated February 28, 2002) for shallow ground water discharging to surface waters;
2. Vapor intrusion criteria; or
3. Dermal exposure to workers during excavations.

In addition, it should be made clear that the only screening criteria that is applied to deep till well data is the MCL/EDWL criteria.

The text referenced above shall be revised to maintain areas for further investigation if any of the above risk-based screening criteria for shallow ground water are exceeded. The text shall also be revised to maintain areas for further investigation where deep till well data exceed MCLs or EDWLs. The text and figures for each SWMU and AOC or AOI data evaluation must be revised accordingly.

44. Section 4.2.2.2, Page 27, Paragraph 4. The text states that if turbidity results from monitoring wells exceed 5 nephelometric turbidity units (NTU) then dissolved metals analysis will be used for assessing the significance of metals concentrations.

The use of 5 NTU criteria to determine whether to use filtered data is acceptable except when a formation is characterized by a high degree of particle mobility or when conducting a risk assessment and exposure to the filtered particles would be likely (Ohio EPA February 1995, Pages 10-20 and 10-21). In the case of dermal exposure to metals in an excavation non-filtered data should be used in the risk evaluation. Another point of clarification is that the 5 NTU criterion is used as a limit that below which there should be no filtering and if above filtering may be justified. It must first be shown that the well has been properly developed with stable turbidity measurements, low flow sampling procedures must have been employed, and the particle size to be filtered must not be likely to be mobile in the formation being monitored (5 micron filter size is recommended).

Totals analysis results shall be used when evaluating dermal exposure to metals. The following additional text sections will need to be revised accordingly:

- i. Section 4.3.1.4, Page 33, Bullet 4, Paragraph 2;
- ii. Section 4.3.2.4, Page 42, Bullet 2, Paragraph 2;
- iii. Section 4.3.2.4, Page 43, Bullet 2, Paragraph 2;
- iv. Section 4.3.2.5, Page 45, Bullet 2, Paragraph 2;
- v. Section 4.3.3.4, Page 53, Paragraph 1;
- vi. Section 4.3.3.4, Page 53, Bullet 2, Paragraph 2;
- vii. Section 4.3.3.4, Page 54, Paragraph 1;
- viii. Section 4.3.4.4, Page 61, Paragraph 1;
- ix. Section 4.3.4.4, Page 62, Paragraph 1;

- x. Section 4.3.5.4, Page 68, Bullet 2, Paragraph 2;
- xi. Section 4.3.5.4, Page 69, Bullet 1, Paragraph 2;
- xii. Section 4.3.11.4, Page 84, Bullet 3, Paragraph 2;
- xiii. Section 4.3.11.4, Page 86, Paragraph 1;
- xiv. Section 4.3.11.4, Page 87, Paragraph 2;
- xv. Section 4.3.11.5, Page 88, Bullet 2;
- xvi. Section 4.3.11.5, Page 89, Paragraph 1;
- xvii. Section 4.3.12.4. Page 96, Paragraph 1.

45. Section 4.2.2.2, Page 27, Paragraph 5. ESOI states that "surface water characterization data are quantitatively compared to the risk-based screening criteria described above..." The criteria referenced is MCLs/EDWLs. The RFI Work Plan states that "surface water results will be evaluated using applicable standards based on the Ohio Water Quality Criteria applicable to the designated classification of the surface water body (OAC 3745-1), USEPA ambient water quality criteria (USEPA 1999b) and USEPA Region 5 ecological screening criteria (USEPA 1998c) for surface water." ESOI shall revise this paragraph to reference the surface water screening criteria approved in the RFI Work Plan.
46. Section 4.2.2.4, Page 29, Bullet 1. As discussed in the General Comments, the cap depths (from Table 4.1) in some areas (e.g., SWMU 6) appear to be inadequate. Cap depths of less than 36 inches subject ecological receptors (e.g., burrowing animals, earthworms that serve as a food source for higher trophic levels, etc.) to potential exposure to waste materials (this may be exacerbated by cracking of clay soils resulting from freeze/thaw cycles). Cap depths should be measured more accurately than the nearest foot to assure that ecological receptors have a minimum chance for exposure and to protect from freeze/thaw damage to ensure the integrity of the cap. If cap depths are not increased to 36 inches, it is necessary that these areas are delineated and all contaminants present within the top 36 inches are properly characterized with adequate samples to determine maximum concentrations in these area(s).
47. Section 4.3.1.5, Page 34, Paragraph 3, Bullet 1 and Page 35, Bullets 1, 2, and 3. SWMU 1 Recommendations for Phase II Investigation shall also include the following:
 - i. Re-evaluation of Phase I data comparing analytical results to recalculated EDWLs.
 - ii. The re-evaluation shall include comparison of water table interface well data and lacustrine/upper till well data to surface water risk values.
 - iii. The re-evaluation shall include comparison of water table interface well data and lacustrine/upper till well data to risk based concentrations protective of inhalation of vapors from ground water by future building occupants (vapor intrusion) in addition to comparison to risk-based dermal exposure. Data failing either risk-based limit shall not be screened.
 - iv. The re-evaluation of deep till wells shall use MCLs and EDWLs for the screening criteria.
 - v. Resampling existing wells to confirm laboratory analytical results was not included in the Phase I RFI Work Plan as a characterization strategy.

Resampling can be justified in instances where the analytical results may be unreliable due to suspected or documented problems related to sample collection in the field or analytical procedures in the laboratory. However, resampling does not appear to be justified as a primary characterization method unless the Phase I results appear to be suspect. Absent suspect data, it is not clear why ESOI is recommending to resample. In addition, resampling can be ambiguous due to the difficulty in identifying the cause for the increase/decrease in concentration. To demonstrate that a result was not a valid result would require analysis of long term trends from an established monitoring well or multiple sample locations and depths to verify the validity or lack thereof. In instances where Phase I results appear unreliable, resampling of constituents detected during Phase I may be conducted. However, the risk evaluation shall use the highest value of the two sampling events. Revise the RFI Phase I Report to clearly indicate the justification for resampling and describe how the resampling results will be used to implement the Phase II Work Plan.

- vi. Resampling of all bias low data (data qualified UJ) at temporary well locations.
- vii. Areas with constituents that historically have been above screening criteria shall be maintained for further investigation of the extent of contaminant plumes.
- viii. Installation of step-out wells to determine horizontal extent of any contaminants exceeding screening criteria. If it is assumed that the surface water body exposure pathway is complete, failure of the discharge to surface water screening criteria (as defined in Section 4.2, Page 4-3, Bullet 4 of the RFI Work Plan dated February 28, 2002) alone will not require the installation of step out wells.

However, if it is assumed that the surface water body exposure pathway is complete, the data should still be evaluated for dermal contact, inhalation of ground water vapors by workers during excavations and inhalation of ground water vapors by future building occupants. Should the data fail one of these screening criteria, then step out wells shall be installed to determine the horizontal extent of this exposure(s).

- ix. Install permanent ground water monitoring wells (lacustrine/upper till, upper till/lower till, bedrock) near temporary well location T-36.
- x. Evaluation of occasional historical detections of volatile organic compounds (VOCs) in bedrock monitoring well R-9 (i.e. October 2000, toluene 1.3 µg/l and xylene 2.1 µg/l ESOI February 2001) may be conducted dependent upon the findings of the additional investigation conducted at well location R-4.

48. Section 4.3.2.3, Page 39, Paragraph 1. This section gives information regarding the depth of waste and the depth of leachate (which may vary over time) in this unit and suggests that "a potential for a hydraulic connection between shallow ground water along SWMU 5 and Otter Creek may exist." This area should be further investigated

using samples of migrating water and associated soils and cores of sediments to see if contaminants are migrating or have migrated from this unit into Otter Creek. Contaminants known to be in the creek and/or the unit should all be assessed (*i.e.*, PCBs). A demonstration that some of the water goes under Otter Creek is not equivalent to a demonstration that a release has not occurred. Analyzing soils and sediments may assess past or potential releases, since some contaminants will “stick” to the soil particles (which can slow contaminant migration).

49. Section 4.3.2.4, Page 40, Bullet 2. ESOI’s conclusion that no further investigation of organic vapor levels is warranted raises concerns. ESOI reported in correspondence to Ohio EPA dated July 2, 2001, July 7, 2001, August 3, 2001, September 13, 2001 and December 5, 2001 that Monitoring Probe 13 (MP13) has had sustained elevated readings. Further evidence of historical sustained elevated readings causing explosive gas concerns along the west side of Millard Avenue Landfill (SWMU 5) is evident by the status of monitoring locations 11, 12A, and 13 being on an increased monitoring schedule as part of the facility’s Contingency Plan requirements of the *Explosive Gas Monitoring Plan*.

ESOI should take this information and the contamination that was identified along the west side of SWMU 5 during Phase I of the RFI into consideration before making a no further action determination. As such, revise the RFI Phase I Report to indicate that further investigation of organic vapor levels will be conducted at MP13.

50. Section 4.3.2.5, Page 44, Paragraph 2. ESOI shall revise the Recommendations for Phase II Investigation to include a discussion of additional investigations that will be conducted at MP13.
51. Section 4.3.2.5, Page 44, Bullets 1 and 2, and Page 45, Bullets 1, 2, and 3. SWMU 5 Recommendations for Phase II Investigation shall also include the following:
- a. Re-evaluation of Phase I data comparing analytical results to recalculated EDWLs;
 - b. The re-evaluation shall include comparison of water table interface well data and lacustrine/upper till well data to surface water risk values (all wells along the north, south, east, and west boundaries of SWMU 5);
 - c. The re-evaluation shall include comparison of water table interface well data and lacustrine/upper till well data to risk based concentrations protective of inhalation of vapors from ground water by future building occupants (vapor intrusion) in addition to comparison to risk-based dermal exposure. Data failing either risk-based limit shall not be screened;
 - d. The re-evaluation for deep till wells shall use the MCLs/EDWLs for screening criteria;
 - e. Resampling existing wells to confirm laboratory analytical results was not included in the Phase I RFI Work Plan as a characterization strategy. Resampling can be justified in instances where the analytical results may be unreliable due to suspected or documented problems related to sample collection in the field or analytical procedures in the laboratory. However,

resampling does not appear to be justified as a primary characterization method unless the Phase I results appear to be suspect. Absent suspect data, it is not clear why ESOI is recommending to resample. In addition, resampling can be ambiguous due to the difficulty in identifying the cause for the increase/decrease in concentration. To demonstrate that a result was not a valid result would require analysis of long term trends from an established monitoring well or multiple sample locations and depths to verify the validity or lack thereof. In instances where Phase I results appear unreliable, resampling of constituents detected during Phase I may be conducted. However, the risk evaluation shall use the highest value of the two sampling events. Revise the RFI Phase I Report to clearly indicate the justification for resampling and describe how the resampling results will be used to implement the Phase II Work Plan.

- f. Resampling of all bias low data (data qualified UJ) at temporary well locations and resampling of rejected data (data qualified R);
- g. Areas with constituents that historically have been above screening criteria shall be maintained for further investigation of the extent of contaminant plumes;
- h. Installation of step-out wells to determine horizontal extent of any contaminants exceeding screening criteria. If it is assumed that the surface water body exposure pathway is complete, failure of the discharge to surface water screening criteria (as defined in Section 4.2, Page 4-3, Bullet 4 of the RFI Work Plan dated February 28, 2002) alone will not require the installation of step out wells.

However, if it is assumed that the surface water body exposure pathway is complete, the data should still be evaluated for dermal contact, inhalation of ground water vapors by workers during excavations and inhalation of ground water vapors by future building occupants. Should the data fail one of these screening criteria, then step out wells shall be installed to determine the horizontal extent of this exposure(s).

- i. Ohio EPA field notes recorded oil or brown liquid in wells T-20S, T-21S, and T-23S in the depth range of 10 feet to 14 feet and well T-24D from 60 to 62 feet. Phase II shall include checking these wells for non aqueous phase liquids. These wells shall also be sampled during Phase II for both aqueous and non aqueous phases.
- j. Installation of a well at well location T-25D to sample and analyze ground water in the sand noted at a depth of 41 feet to 48 feet below ground surface. A soil sample was taken at this depth during phase I. However, the report does not include any analysis results for VOCs and field notes indicate a FID reading of 578.5 ppm was observed.
- k. Installation and sampling of wells not installed during Phase 1 (T-18D, T-25D, T-26D, and T-27D) if their associated shallow well or adjacent well (F-1DA, G-6, G-8, MR-1SA, MR4S, T-18S, T-25S, T-26S, and T-27SD) exceeds any of the recalculated screening criteria.

- l. Installation of a bedrock monitoring well at the location of well nest MR-3D and S to monitor the vertical extent of contaminants identified in monitoring well MR-3D and to provide adequate monitoring for the westerly flow component in the bedrock aquifer.
- m. Install permanent monitoring well nests (bedrock; upper till/lower till; and lacustrine/upper till) at temporary well locations T-17, T-20, and T-23.
- n. Evaluation of occasional historical detections of volatile organic compounds (VOCs) in bedrock monitoring well R-4 [i.e. April 2002, 1,1,1-trichloroethane 2.8 µg/l; July 2002, xylene 2.7 µg/l and toluene 0.7 µg/l; and January 1999, 1,1,1-trichloroethane 1.6 µg/l (ESOI July 2002, February 2001, and September 1999)]. The evaluation shall include sampling of bedrock well R-4 using diffusion samplers or micro purging and sampling procedures to collect discrete samples from the top foot, middle foot, and bottom foot of the screened interval. Installation of a monitoring well to collect a ground water sample from the lower till / bedrock interface for VOCs analysis. Diffusion sampling and/or micro-purging and sampling procedures shall be submitted to U.S. EPA for approval 30 days prior to conducting the sampling. The presence of contaminants in the bedrock aquifer at any concentration has an impact on the selection of corrective measures for shallow contamination and an impact on the determination of whether the fate and transport calculations from the shallow zones to the bedrock aquifer have been calculated correctly. These additional investigation activities are to determine whether the contaminants are present, but at a concentration below repeatable detection levels and/or if the current bedrock monitoring procedures and screen intervals provide adequate monitoring.

52. Section 4.3.2.5, Page 45, Dash 3. The text states that permanent shallow and deep till monitoring wells will be installed at the location of temporary wells T-17S/D and T-26S/D. These locations are not the same as noted on the map, Figure 5.1. The map shows permanent wells being installed at well locations T-17S/D, T-20S/D, and T-23S/D.

The report text needs to be revised to match the Figure 5.1 and the text and Figure 5.1 need to be revised to include bedrock monitoring wells.

53. Section 4.3.2.5, Page 45, Bullet 2. The text states that if turbidity measurements are greater than 5 neolithic turbidity units (NTU) during sampling then filtered samples will be collected for dissolved metals analysis only, otherwise samples for both total and dissolved metals analysis will be collected.

If turbidity measurements are less than 5 NTU, then only totals analysis are needed. If turbidity measurements are greater than 5 NTU, then dissolved analysis results may be acceptable for the ingestion exposure scenario for upper till/lower till wells and bedrock wells. However, total metal analysis results are still necessary for the dermal exposure risk evaluation for water table well data and lacustrine/upper till well data.

54. Section 4.3.2.5, Page 46, Soils. The boring log for location T-21 indicates that there is "some black staining from 15 feet to 15.5 feet." ESOI shall revise the

Recommendations for Phase II Investigation to include sampling of the stained area, analysis for the Phase I Parameter List, and additional investigation of the extent of the noted staining.

55. Section 4.3.3.3, Page 49, Paragraph 1. ESOI states that "there is no separation between SWMU 6, 7, and 9." ESOI shall also state that the boundary of these connected units extends north from the North Sanitary Landfill (SWMU 6) almost to the property line; south from the New Oil Pond (SWMU 9) to the City of Toledo waterline; west of SWMU 6, the Central Sanitary Landfill (SWMU 7), and SWMU 9 to the eastern boundary of Cell F (SWMU 1) and Cell G (SWMU 2); and east of SWMUs 6, 7 and 9 almost to the property line and the western boundary with Cell H (SWMU 3).
56. Section 4.3.3.4, Page 50, Bullet 2. ESOI states that the screening level was exceeded at PB3 at the time of the RFI monitoring event but that subsequent monthly sustained readings from PB3 did not exceed the screening level. ESOI justifies no further action based on sustained readings taken subsequent to the RFI monitoring event.

ESOI's justification for no further action is a concern. Resampling events were not included in the Phase I RFI Work Plan as a characterization strategy. Resampling can be justified in instances where the monitoring results may be unreliable due to suspected or documented problems related to monitoring in the field. However, resampling does not appear to be justified as a primary characterization method unless the Phase I results appear to be suspect. In addition, PB3 has historically had elevated readings as reported by ESOI in correspondence to Ohio EPA dated September 13, 2001 and August 3, 2001. Further evidence of historical elevated sustained readings causing explosive gas concerns along the north side of the facility is evident by the status of monitoring locations 2, 2A, 3A, 4, 4A, 5 and 5A being on an increased monitoring schedule as part of the facility's Contingency Plan requirements of the *Explosive Gas Monitoring Plan*.

Further, ESOI states that the "thickness of the existing cap is reasonably expected to mitigate any significant vapor migration." However, explosive gas has already migrated beyond the unit boundary to the PB3 location.

ESOI shall revise the RFI Phase I Report by striking the following sentence: "however subsequent monthly sustained readings from PB3 have not exceeded the screening level." The paragraph shall also be revised to indicate that additional investigation will be necessary.

57. Section 4.3.3.4, Page 51, Bullet 2. ESOI states that the exceedances at sample locations QE-360 and QE-360B have been fully delineated by other samples collected as part of the North Sanitary Landfill (SWMU 6) RFI. Revise the RFI Phase I Report to include the sample locations that reportedly delineate the exceedances and the criteria that was used to determine that an exceedance has been delineated.
58. Section 4.3.3.5, Page 54, Paragraph 1, Landfill Cover. ESOI states that "Based on the evaluation of the Phase I results presented above, no further characterization of the landfill cover is warranted." However, during Phase I of the investigation, ESOI determined that the unit boundaries for the North Sanitary Landfill (SWMU 6) extend beyond the SWMU limits as shown on the RFI Work Plan. The SWMU limits based on Phase I indicate that the unit boundary extends north from the northern edge of SWMU

6 almost to the northern property line, west to the eastern boundary of Cell F (SWMU 1) and east almost to the property line. The southern boundary of SWMUs 6, 7 and 9 is the City of Toledo Waterline. This means that there is waste under the haul roads and other areas (previously identified as outside the unit boundaries) surrounding SWMU 6. Revise the Phase II Investigation to include additional sampling locations to assess the adequacy of the cover of these newly discovered waste disposal areas.

In addition, in-field permeability testing (ASTM D 6391) more accurately depicts the in-field conditions of the cover soils than thin-walled metal tube recovery of relatively undisturbed soil samples (ASTM D 1587) suitable for laboratory testing (ASTM D 5084). As such, ESOI should consider using the most current version of the Field Measurement of Hydraulic Conductivity Limits (ASTM D 6391) to support the ASTM D 1587/ASTM D5084 data in assessing the permeability of the soils at the designated Phase II sample locations.

Finally, if the objective of the proposed physical properties samples is to demonstrate suitable cover soils in the newly discovered waste disposal areas around the North Sanitary Landfill (SWMU 6), the Central Sanitary Landfill (SWMU 7) and the New Oil Pond (SWMU 9) this will not necessarily mean that corrective measures, such as proper grading and drainage, are not warranted.

59. Section 4.3.3.5, Page 54, Paragraph 1, Landfill Gas. ESOI shall revise the Recommendations for Phase II Investigation to include a discussion of an additional investigation that will be conducted at PB3.
60. Section 4.3.3.5, Page 55, Bullets 1 and 2. SWMU 6 Recommendations for Phase II Investigation shall also include the following:
 - i. Re-evaluation of Phase I data comparing analytical results to recalculated EDWLs.
 - ii. The re-evaluation shall include comparison of water table interface well data and lacustrine/upper till well data to surface water risk values (as defined in Section 4.2, Page 4-3, Bullet 4 of the RFI Work Plan dated February 28, 2002)(all wells along the northern and eastern boundaries of SWMU 6).
 - iii. The re-evaluation shall include comparison of water table interface well data and lacustrine/upper till well data to risk based concentrations protective of inhalation of vapors from ground water by future building occupants (vapor intrusion) in addition to comparison to risk-based dermal exposure. Data failing either risk-based limit shall not be screened.
 - iv. The re-evaluation of deep till well data shall use MCLs/EDWLs for the screening criteria.
 - v. Resampling existing wells to confirm laboratory analytical results was not included in the Phase I RFI Work Plan as a characterization strategy. Resampling can be justified in instances where the analytical results may be unreliable due to suspected or documented problems related to sample collection in the field or analytical procedures in the laboratory. However, resampling does not appear to be justified as a primary characterization

method unless the Phase I results appear to be suspect. Absent suspect data, it is not clear why ESOI is recommending to resample. In addition, resampling can be ambiguous due to the difficulty in identifying the cause for the increase/decrease in concentration. To demonstrate that a result was not a valid result would require analysis of long term trends from an established monitoring well or multiple sample locations and depths to verify the validity or lack thereof. In instances where Phase I results appear unreliable, resampling of constituents detected during Phase I may be conducted. However, the risk evaluation shall use the highest value of the two sampling events. Revise the RFI Phase I Report to clearly indicate the justification for resampling and describe how the resampling results will be used to implement the Phase II Work Plan.

- vi. Resampling of all bias low data (data qualified UJ) at temporary well locations;
- vii. The baseline risk evaluation requires all organic constituents detected below quantitation limits to be included in the risk evaluation using a value equal to one half of the SQL. To ensure that all organic constituents detected are included in the risk evaluation, Phase II analysis results for those constituents that are detected above the method detection limit, but below the estimated quantitation limit shall be reported with estimated concentrations ("J" qualified). The RFI Phase I Report needs to be revised to provide a list of all organic constituents for each SWMU or AOC that were detected above the method detection limit. The Phase II report shall include a list of all organic constituents for each SWMU or AOC that were detected above the method detection limit during Phase I and/or II;
- viii. Areas with constituents that historically have been above screening criteria shall be maintained for further investigation of the extent of contaminant plumes;
- ix. Installation of a bedrock monitoring well at the location of well nest SW-3S/D to monitor the vertical extent of contaminants identified in monitoring well SW-3D and to provide adequate monitoring of the easterly flow component in the bedrock aquifer;
- x. Install permanent monitoring well nests (bedrock; upper till/lower till; and lacustrine/upper till) at temporary well locations T-1 and QD-3;

61. Section 4.3.4.5, Page 62, Paragraph 1. ESOI states that based on the evaluation of the Phase I results, no further characterization of the landfill cover is warranted. However, during Phase I of the investigation, ESOI determined that the unit boundaries for the Central Sanitary Landfill (SWMU 7) extend west to the eastern boundary of Cell G (SWMU 2) and east to the western boundary with Cell H (SWMU 3). The northern and southern boundaries of SWMUs 6, 7 and 9 extend north almost to the northern property line and south to the City of Toledo waterline. This means that there is waste under the haul roads and other areas (previously identified as outside the unit boundary) surrounding SWMU 7. ESOI has not proposed additional sampling locations on the west side, east side or northeast corner of SWMU 7. ESOI shall revise the Phase II Investigation to include additional sampling locations to assess the adequacy of the

cover of these newly discovered waste disposal areas.

In addition, in-field permeability testing (ASTM D 6391) more accurately depicts the in-field conditions of the cover soils than thin-walled metal tube recovery of relatively undisturbed soil samples (ASTM D 1587) suitable for laboratory testing (ASTM D 5084). As such, ESOI should consider revising the Phase II Work Plan to include the use of the most current version of the Field Measurement of Hydraulic Conductivity Limits (ASTM D 6391) to support the ASTM D 1587/ASTM D5084 data in assessing the permeability of the soils at the designated Phase II sample locations.

Finally, if the objective of the proposed physical properties samples is to demonstrate suitable cover soils in the newly discovered waste disposal areas around the North Sanitary Landfill (SWMU 6), the Central Sanitary Landfill (SWMU 7) and the New Oil Pond (SWMU 9) this will not necessarily mean that corrective measures, such as proper grading and drainage, are not warranted.

62. Section 4.3.4.5, Page 63, Bullets 1 and 2. SWMU 7 and North side of SWMU 3 Recommendations for Phase II Investigation shall also include the following:

- i. Re-evaluation of Phase I data comparing analytical results to recalculated EDWLs.
- ii. The re-evaluation shall include comparison of water table interface well data and lacustrine/upper till well data to risk based concentrations protective of inhalation of vapors from ground water by future building occupants (vapor intrusion) in addition to comparison to risk-based dermal exposure. Data failing either risk-based limit shall not be screened.
- iii. The re-evaluation shall include comparison of data from water table interface wells and lacustrine/upper till wells along the north side of SWMU 3 to surface water risk values.
- iv. The re-evaluation of deep till well data shall use MCLs/EDWLs for the screening criteria.
- v. Resampling existing wells to confirm laboratory analytical results was not included in the Phase I RFI Work Plan as a characterization strategy. Resampling can be justified in instances where the analytical results may be unreliable due to suspected or documented problems related to sample collection in the field or analytical procedures in the laboratory. However, resampling does not appear to be justified as a primary characterization method unless the Phase I results appear to be suspect. Absent suspect data, it is not clear why ESOI is recommending to resample. In addition, resampling can be ambiguous due to the difficulty in identifying the cause for the increase/decrease in concentration. To demonstrate that a result was not a valid result would require analysis of long term trends from an established monitoring well or multiple sample locations and depths to verify the validity or lack thereof. In instances where Phase I results appear unreliable, resampling of constituents detected during Phase I may be conducted. However, the risk evaluation shall use the highest value of the two sampling events. Revise the RFI Phase I Report to clearly indicate the

justification for resampling and describe how the resampling results will be used to implement the Phase II Work Plan.

- vi. Resampling of all bias low data (data qualified UJ) at temporary well locations.
- vii. Areas with constituents that historically have been above screening criteria shall be maintained for further investigation of the extent of contaminant plumes.
- viii. Installation of step-out wells to determine horizontal extent of any contaminants exceeding screening criteria. If it is assumed that the surface water body exposure pathway is complete, failure of the discharge to surface water screening criteria (as defined in Section 4.2, Page 4-3, Bullet 4 of the RFI Work Plan dated February 28, 2002) alone will not require the installation of step out wells.

However, if it is assumed that the surface water body exposure pathway is complete, the data should still be evaluated for dermal contact, inhalation of ground water vapors by workers during excavations and inhalation of ground water vapors by future building occupants. Should the data fail one of these screening criteria, then step out wells shall be installed to determine the horizontal extent of this exposure(s).

- ix. Investigate cap thickness in hull road near well location T-5. Phase I well log for this location noted 2 feet of clay between gravel road and waste. Ohio EPA noted waste was directly below gravel road base.

63. Section 4.3.7.5, Page 72. Include the following revisions in SWMU 12 Recommendations for Phase II Investigation:

- i. Re-evaluation of Phase I data comparing analytical results to recalculated EDWLs.
- ii. The re-evaluation shall include comparison of water table interface well data and lacustrine/upper till well data to risk based concentrations protective of inhalation of vapors from ground water by future building occupants (vapor intrusion) in addition to comparison to risk-based dermal exposure. Data failing either risk-based limit shall not be screened.
- iii. The re-evaluation of deep till well data shall use MCLs/EDWLs for the screening criteria.
- iv. Resampling existing wells to confirm laboratory analytical results was not included in the Phase I RFI Work Plan as a characterization strategy. Resampling can be justified in instances where the analytical results may be unreliable due to suspected or documented problems related to sample collection in the field or analytical procedures in the laboratory. However, resampling does not appear to be justified as a primary characterization method unless the Phase I results appear to be suspect. Absent suspect

data, it is not clear why ESOI is recommending to resample. In addition, resampling can be ambiguous due to the difficulty in identifying the cause for the increase/decrease in concentration. To demonstrate that a result was not a valid result would require analysis of long term trends from an established monitoring well or multiple sample locations and depths to verify the validity or lack thereof. In instances where Phase I results appear unreliable, resampling of constituents detected during Phase I may be conducted. However, the risk evaluation shall use the highest value of the two sampling events. Revise the RFI Phase I Report to clearly indicate the justification for resampling and describe how the resampling results will be used to implement the Phase II Work Plan.

- v. Resampling of all bias low data (data qualified "UJ") at bubble well locations.
- vi. Installation of step-out wells to determine horizontal extent of any contaminants exceeding screening criteria.

64. Section 4.3.11.2, Page 80, Bullet 1. The text states that the flow direction of water in the monitoring/dewatering trenches along the Toledo water lines will be determined. The Phase I Report does not report the findings for this investigation activity.

The RFI Phase I Report should be revised to include the flow direction of water in the trenches along the Toledo water lines.

65. Section 4.3.11.5, Page 88, Bullets 1, 2 and 3 and Page 89, Bullet 1. Investigation Unit A, Recommendations for Phase II Investigation shall also include the following:

- i. Re-evaluation of Phase I data comparing analytical results to recalculated EDWLs.
- ii. The re-evaluation shall include comparison of water table interface well data and lacustrine/upper till well data to risk based concentrations protective of inhalation of vapors from ground water by future building occupants (vapor intrusion) in addition to comparison to risk-based dermal exposure. Data failing either risk-based limit shall not be screened.
- iii. The re-evaluation shall include comparison of data from trench sumps that discharge to the ground surface, water table interface wells and lacustrine/upper till wells to surface water risk values (ground water to storm sewers along York street, to Otter Creek).
- iv. The re-evaluation of deep till well data shall use MCLs/EDWLs for the screening criteria.
- v. Resampling to confirm any exceedance based on the re-evaluation discussed above.
- vi. Resampling of all bias low data (data qualified "UJ") at temporary well locations.
- vii. Installation of step-out wells to determine horizontal extent of any

contaminants exceeding screening criteria. If it is assumed that the surface water body exposure pathway is complete, failure of the discharge to surface water screening criteria (as defined in Section 4.2, Page 4-3, Bullet 4 of the RFI Work Plan dated February 28, 2002) alone will not require the installation of step out wells.

However, if it is assumed that the surface water body exposure pathway is complete, the data should still be evaluated for dermal contact, inhalation of ground water vapors by workers during excavations and inhalation of ground water vapors by future building occupants. Should the data fail one of these screening criteria, then step out wells shall be installed to determine the horizontal extent of this exposure(s).

66. Section 4.3.11.3, Page 81, Bullet 0. ESOI notes that during the installation of T-42, an on-site water line was broken. ESOI shall revise the RFI Phase I Report to note that the soil was stained in and around the water line.
67. Section 4.3.11.3, Page 83, Paragraph 2. ESOI states that "there is no separation between SWMU 6, 7, and 9." ESOI shall also state that the boundary of these connected units extends north from the North Sanitary Landfill (SWMU 6) to the property line; south from the New Oil Pond (SWMU 9) to the City of Toledo waterline; west of SWMU 6, the Central Sanitary Landfill (SWMU 7), and SWMU 9 to the eastern boundary of Cell F (SWMU 1) and Cell G (SWMU 2); and east of SWMUs 6, 7 and 9 to the property line and the western boundary with Cell H (SWMU 3).
68. Section 4.3.11.5, Page 89, Soils. The boring log for location T-54 indicates that there is "some black staining from 10 feet to 13 feet". ESOI shall revise the Phase II Work Plan to include additional investigation of the extent of noted staining, and sampling and analysis of the stained area for the Phase I Parameter List.
69. Section 4.3.11.5, Page 90, Bullet 2. ESOI has proposed to determine if any contaminant migration from SWMU 8 is occurring along the water line by collecting a soil sample from below the invert pipe west of SWMU 8 and analyzing the sample for the Phase I Parameter list. Appendix G, Water Line Figure for SWMU 8, shows a 6" sewer line going to the storm sewer catch basin. The figure indicates that the sewer line has been blocked off. However, as this is a preferential contaminant migration pathway, like the water line, ESOI shall conduct additional soil sampling to determine if contamination has migrated off-site along this pathway. Revise the Recommendations for Phase II Investigation to include additional sample locations at each end of the sewer line and analyze for the Phase I Parameter List.
70. Section 4.3.12.3, Page 93, Paragraph 1. ESOI states that "there is no separation between SWMUs 6, 7, and 9." ESOI shall also state that the boundary of these connected units extends north from the North Sanitary Landfill (SWMU 6) almost to the property line; south from the New Oil Pond (SWMU 9) to the City of Toledo waterline; west of SWMU 6, the Central Sanitary Landfill (SWMU 7), and SWMU 9 to the eastern boundary of Cell F (SWMU 1) and Cell G (SWMU 2); and east of SWMUs 6, 7 and 9 almost to the property line and to the western boundary with Cell H (SWMU 3).
71. Section 4.3.12.5, Page 96, Paragraph 1. ESOI states based on the evaluation of the Phase I results, no further characterization of the landfill cover is warranted. However,

during Phase I of the investigation, ESOI determined that the unit boundary for SWMU 9 extends west to the eastern boundary of Cell G (SWMU 2), east to the western boundary with Cell H (SWMU 3), and south to the City of Toledo Waterline. The northern boundary of SWMUs 6, 7, and 9 extends north almost to the northern property line. This means that there is waste under the haul roads and other areas (previously identified as outside the unit boundary) surrounding SWMU 9. ESOI has not proposed additional sampling locations on the north side, southwest corner or the east side of SWMU 9. Revise the Phase II Investigation to include additional sampling locations to assess the adequacy of the cover on these newly discovered waste disposal areas.

In addition, in-field permeability testing (ASTM D 6391) more accurately depicts the in-field conditions of the cover soils than thin-walled metal tube recovery of relatively undisturbed soil samples (ASTM D 1587) suitable for laboratory testing (ASTM D 5084). As such, ESOI should consider using the most current version of the Field Measurement of Hydraulic Conductivity Limits (ASTM D 6391) to support the ASTM D 1587/ASTM D5084 data in assessing the permeability of the soils at the designated Phase II sample locations.

Finally, if the objective of the proposed physical properties samples is to demonstrate suitable cover soils in the newly discovered waste disposal areas around the North Sanitary Landfill (SWMU 6), the Central Sanitary Landfill (SWMU 7) and the New Oil Pond (SWMU 9) this will not necessarily mean that corrective measures, such as proper grading and drainage, are not warranted.

72. Section 4.3.12.5, Page 97, Bullets 1 and 2. Investigation Unit B, Recommendations for Phase II Investigation shall also include the following:

- i. Re-evaluation of Phase I data comparing analytical results to recalculated EDWLs.
- ii. The re-evaluation shall include comparison of water table interface well data and lacustrine/upper till well data to risk based concentrations protective of inhalation of vapors from ground water by future building occupants (vapor intrusion) in addition to comparison to risk-based dermal exposure. Data failing either risk-based limit shall not be screened.
- iii. The re-evaluation shall include a comparison of surface water risk values to data from trench sumps that discharge to the ground surface, to water table interface wells, and to lacustrine/upper till wells to surface water risk values (ground water to storm sewers along York street which discharge to Otter Creek).
- iv. The re-evaluation of deep till well data shall use MCLs/EDWLs for the screening criteria.
- v. Resampling existing wells to confirm laboratory analytical results was not included in the Phase I RFI Work Plan as a characterization strategy. Resampling can be justified in instances where the analytical results may be unreliable due to suspected or documented problems related to sample collection in the field or analytical procedures in the laboratory. However, resampling does not appear to be justified as a primary characterization

method unless the Phase I results appear to be suspect. Absent suspect data, it is not clear why ESOI is recommending to resample. In addition, resampling can be ambiguous due to the difficulty in identifying the cause for the increase/decrease in concentration. To demonstrate that a result was not a valid result would require analysis of long term trends from an established monitoring well or multiple sample locations and depths to verify the validity or lack thereof. In instances where Phase I results appear unreliable, resampling of constituents detected during Phase I may be conducted. However, the risk evaluation shall use the highest value of the two sampling events. Revise the RFI Phase I Report to clearly indicate the justification for resampling and describe how the resampling results will be used to implement the Phase II Work Plan.

- vi. Resampling of all bias low data (data qualified UJ) at temporary well locations.
- vii. Installation of step-out wells to determine horizontal extent of any contaminants exceeding screening criteria. If it is assumed that the surface water body exposure pathway is complete, failure of the discharge to surface water screening criteria (as defined in Section 4.2, Page 4-3, Bullet 4 of the RFI Work Plan dated February 28, 2002) alone will not require the installation of step out wells.

However, if it is assumed that the surface water body exposure pathway is complete, the data should still be evaluated for dermal contact, inhalation of ground water vapors by workers during excavations and inhalation of ground water vapors by future building occupants. Should the data fail one of these screening criteria, then step out wells shall be installed to determine the horizontal extent of this exposure(s).

- 73. Section 4.3.13.1, Page 99, Paragraph 2. Add to this paragraph that U.S. EPA did not concur with or approve the NSL ecological assessment or its conclusions.
- 74. Section 4.4, Page 103, Paragraph 1. ESOI states that "Upper-bound estimates of cumulative cancer risk and noncancer HI for potential exposure of routine workers to on-site soil are calculated based on the maximum concentrations detected in soil at any depth in each area investigated." This is misleading as the full rate and extent of each area investigated has not been determined. Therefore, ESOI cannot assume that the maximum concentrations have been found. In addition, ESOI states that conservative risk-based screening criteria "are derived from USEPA Region 9 risk-based PRGs for soil." USEPA approved the use of Region 9 PRGs in the RFI Work Plan. Therefore, ESOI may not use derived comparison standards. Finally, the criteria for screening out investigation areas for "no further action" is established in the RFI Work Plan. ESOI may not make "no further action" determinations based on preliminary cumulative risk calculations.

In addition, ESOI shall provide to U.S. EPA, for approval, all baseline risk assessment calculations that will be used in the baseline risk assessment at least 60 days prior to the release of the Phase II Report.

- 75. Section 4.4, Page 104, Paragraph 1. It is U.S. EPA policy that if a state has a clearly

defined risk number, then the EPA will adhere to the state policy. Ohio EPA has two risk goals, one for screening to address cumulative risk and one for cleanup level. For screening for cumulative risk, Ohio EPA uses a more conservative 10E-6 and an HI of 0.1. Ohio EPA's baseline risk assessment goal for cumulative cancer risk is 10E-5 and an HI of 1 for non cancer effects (Ohio EPA 1999).

76. Section 4.5.1.4, Page 107, Paragraph 1. ESOI states that "an assessment of Otter Creek conducted by the USEPA in 1976 concluded that the lower two-thirds of Otter Creek was not conducive to supporting or maintaining aquatic biota." As this study was conducted 27 years ago it is not relevant to the current investigation. ESOI must strike this sentence.
77. Section 4.5.2.1, Table 4.14, Table 4.15. Region V EDQLs (ESLs) are based on exposure to one contaminant. As such, when multiple chemicals that likely have the same mechanism of effect (e.g., DDD/DDE/DDT, PAHs, metals) are present, the screening levels should be adjusted accordingly. ESOI shall revise the RFI Phase I Report and Phase II Work Plan to reflect these adjusted levels (i.e., ESL divided by the number of grouped contaminants).
78. Section 4.5.2.2, Page 111, Bullet 2. ESOI states that "The available information indicates that there are no aquatic ecological receptors." This statement is not accurate. Aquatic ecological receptors were identified in the stormwater retention basins (i.e., turtles, frogs, and toads) and drainage ditches on the ESOI facility. ESOI shall revise the RFI Phase I Report to correct this discrepancy.
79. Section 4.5.3, Page 112, Paragraph 1. ESOI states that "...three organic chemicals (2,4,5-trichlorophenol, 2-butanone, and benzene) detected in Otter Creek are not detected in soil and sediment or surface water at SWMU 5." Benzene was detected in shallow soil samples and deep soil samples at SWMU 5. ESOI shall strike the reference to benzene in this paragraph.
80. Section 4.5.3, Page 113, Paragraph 0. ESOI states that the "available information indicates that chemicals at SWMU 5 are not likely migrating to a substantial and measurable degree to Otter Creek." ESOI further states that "If surface water runoff to Otter Creek from SWMU 5 is evident, then it is likely the COPCs do not contribute significantly to the levels in sediments and surface water relative to the contributions from sources upstream of the ESOI Facility." Based on the history of Otter Creek it is understandable that ESOI would reference upstream sources, however, ESOI is still responsible for any contamination from the ESOI facility that is above ecological screening levels. Therefore, the significance of ESOI's contribution to the contamination in Otter Creek relative to upstream sources is irrelevant. ESOI shall clarify that it is understood that the facility is responsible for its contribution to contamination in Otter Creek irrespective of upstream sources.
81. Section 4.5.3, Page 113, Bullets 2 and 3. ESOI mentions screening against background levels at AOC 9 (Cell M Stormwater Basin) and the NPDES outfalls. There are no established background levels for either of these surface water sources. ESOI shall strike the reference to "background levels."
82. Section 4.5.4, Page 114, Paragraph 0. ESOI states that "available sampling results suggest that the occurrence of chemicals in Otter Creek are not related to releases of

hazardous constituents from the ESOI Facility.” Directly after this statement, ESOI indicates that additional sediment sampling is warranted. ESOI cannot make final determinations about the relationship of Otter Creek contamination and releases of hazardous constituents from the ESOI facility until the investigation is complete. Therefore, ESOI shall strike this sentence.

83. Section 4.5.4, Page 115, Bullet 1. The depth of the proposed samples is not indicated. Due to the multitude of current and historical sources of environmental contaminants within the watershed it will be very difficult, but necessary, to clearly demonstrate that ESOI has or has not had an impact to sediment in Otter Creek. Surface sediments collected during the sampling phase will not address the potential historical impacts from the site. Since ESOI has already identified an area in Otter Creek requiring further investigation, deeper sediment sampling is warranted to help determine if offsite migration from SWMU 5 to Otter Creek has occurred. ESOI must revise the Sampling Recommendations for Ecological Investigation to include sediment sampling depths.
84. Section 5.0. ESOI shall revise this section to include a discussion of the Phase II sampling strategy and to clearly state the endpoints for determining the nature and extent of constituents in soil, sediment, surface water and/or ground water. The endpoints shall be based on the most conservative human health or ecological risk screening criteria.
85. Section 5.1, Page 116. The text states that additional data will be collected to determine the nature and extent of constituents in soil, sediment, surface water and/or ground water at certain SWMUs and AOCs, as necessary to support a baseline risk assessment.

The baseline risk assessment must account for additive risk and include all data above background. This means that some areas that passed screening may fail the baseline risk assessment. Also, the baseline risk assessment may identify contaminant plumes where the Phase I and II data do not define the full extent of the area exceeding risk. The full extent of the area exceeding risk must be defined before corrective measures are proposed and evaluated.

ESOI shall revise the Phase II Work Plan to state that the baseline risk assessment will include additive risk for all constituents found above background. Also, the Phase II Work Plan should recognize that multiple well installations with sampling and analysis may be needed to define the full extent of areas failing the baseline risk and to define the full vertical and horizontal extent of areas exceeding background. Therefore, the Phase II Work Plan schedule presented in Table 5.1 may need to be revised to account for multiple well installations.

86. Table 4.2. ESOI shall revise Table 4.2 of the RFI Phase I Report to include a separate column and associated information for Probe ID and SWMU.
87. Table 4.3a. It appears that ESOI subtracted the site specific background concentrations from the measured concentrations before comparing the measured concentrations to the risk-based screening criteria. When the concentrations of site-samples are compared to risk-based screening criteria, the full measured constituent concentration of the sample must be used. Revise the RFI Phase I Report to show a comparison of risk-based screening criteria to the full measured constituent concentration.

88. Table 4.7b.

- a. It is not clear why “potential risk drivers are identified as those chemicals that have a cancer risk greater than 5×10^{-6} and HQ greater than 0.1.” Revise the RFI Phase I Report to explain why this cancer risk endpoint was chosen.
- b. Napthalene is identified as a chemical with a high contribution to potential risk estimates for soil at SWMU 6. Revise the RFI Phase I Report to explain why this chemical and its detected concentrations do not show up in a data box on figure 4.2-2 or 4.2-3.

89. Table 4.11 and Data Summary Tables. Sediment data for PAHs would be more meaningful if values below the reporting level were reported as actual numbers along with the "J" qualifier. Provided these numbers if available in the laboratory's records.

90. Tables 4.13 and 4.14. Table 4.13 is titled “Groundwater Samples Taken Near Surface Water....” Table 4.14 is titled “Sediment Samples Exceeding Screening Criteria.” The Table of Contents indicates the opposite. ESOI shall revise the RFI Phase I Report to correct this discrepancy.

91. Table 5.1, Summary of Phase II RFI Sample Collection and Analysis by Investigation Unit.

- a. Page 2 of 3 lists “COPC” under the Lab Parameters column. ESOI must include a note that identifies what the COPCs are.
- b. Additional sediment samples should be evaluated for grain size analysis and Total Organic Carbon (not specifically addressed in this table). These associated analyses provide important context for evaluating results of chemical contamination.

92. Figure 5.1.

- a. The RFI Phase I Report has two figures labeled 5.1. The figure titled *ESOI Otter Creek Road RFI Schedule* should be labeled 5.2 to agree with the Table of Contents.
- b. The title on figure 5.1 is “Proposed Phase II Sampling Plan, North of York Street.” The Table of Contents indicates that the title of figure 5.1 is “Phase II RFI Sampling Plan.” ESOI shall clarify this discrepancy.
- c. Soil Boring Numbers S10-39, S10-40 and S10-41 indicate that there is waste and/or staining and/or petroleum odor in each of these borings which are located between SWMU 10 and AOC 1. Figure 5.1 also defines the SWMU limits as shown on the RFI Work Plan in green and the SWMU limits based upon Phase I of the RFI in purple. It is not clear why the area between SWMU 10 and AOC 1 has not been included within the SWMU limits. ESOI must include this area within the limits of a unit.

91. Figure 5.2. ESOI has scheduled 40 work days for the Phase II investigation. Given the

number of comments generated during the Agency's review of ESOI RFI Phase I Report and Phase II Work Plan and the additional sampling required by these comments, ESOI should consider revising the Phase II schedule.

92. Appendix C, Field Notes and Boring Logs.

- a. Soil Boring Number: AOC 4-1. The boring log does not match the field notes for 10/3/02. ESOI shall revise the boring log to reflect what is present in the field notes for 10/3/02 and include boring logs and field notes for all soil borings (including step-out borings) and temporary monitoring wells.
- b. Soil Boring Number: S1-3. The boring log does not match the field notes for 8/12/02. ESOI shall revise the boring log to reflect what is present in the field notes for 8/12/02 and include boring logs and field notes for all soil borings (including step-out borings) and temporary monitoring wells.
- c. Soil Boring Number: T-37W, T-37S. The boring log does not match the field notes for 09/11/02. ESOI shall revise the boring log to reflect what is present in the field notes for 09/11/02 and include boring logs and field notes for all soil borings (including step-out borings) and temporary monitoring wells.
- d. Soil Boring Number: T-17S. The boring log notes for this location do not appear to be included in the report. ESOI shall revise the RFI Phase I Report to include the field notes for this location.
- e. Soil Boring Number: S5-21. The boring log does not match the field notes for 09/26/02. ESOI shall revise the boring log to reflect what is present in the field notes for 09/26/02 and include boring logs and field notes for all soil borings (including step-out borings) and temporary monitoring wells.
- f. Soil Boring Number: T-21S. The boring log indicates that there is "some black staining from 15 -15.5 feet." ESOI shall do additional investigation of the extent of noted staining and sample/analyze the stained area in Phase II of the RFI.
- g. Soil Boring Number: T-54. The boring log indicates that there is "some black staining from 10-13 feet. ESOI collected samples at this location from three intervals, 0-6", 4-6' and 7.5-9.5'. It is not clear why ESOI did not collect a sample from the 10 -13 foot interval where the staining was noted. ESOI shall do additional investigation of the extent of the noted staining and sample/analyze the stained area in Phase II of the RFI.
- h. Temporary Monitoring Well Number: T-42W. The date on this boring log is incorrect. T-42W was logged on 8/21/02. ESOI must revise the boring log to reflect the correct date.
- i. Soil Boring Number S7-12. There are several step-outs associated with this boring location. Only one step-out has been translated from field notes to a typed boring log. ESOI shall create typed boring logs for all of the step-outs associated with this location.

Location S7-12 is not identified on any of the figures. ESOI shall revise the RFI

Phase I Report to identify this location on all appropriate figures.

The boring log indicates that location S7-12 had 6 feet of leachate in the borehole but there is no indication that a leachate sample was taken. In accordance with the RFI Work Plan (Page 3-4) ESOI was required to take a leachate sample at this location. ESOI shall revise the Recommendations for Phase II Investigation to include a leachate sample from this location and analysis for the Phase I Parameter List or provide an explanation for not taking the sample.

- j. Soil Boring Number T-42d. The field notes for 8/21/02 indicate that a borehole ending at 10 feet was installed. The boring logs do not include this borehole. ESOI shall revise the RFI Phase I Report to include all of the borings in the boring logs.
- k. Soil Boring Number: S-7 (T-14a & b). This location is not indicated on figure 4.4-3 or figure 5.1. It is assumed that there is a typo and the location is noted as S9-14 on the figures. ESOI shall revise the RFI Phase I Report to clarify this discrepancy.
- l. Temporary Monitoring Well Number: T-4S. The boring log indicates that there is "some black staining from 1.5 - 3 feet." ESOI shall revise the Recommendations for Phase II Investigation to include additional investigation of the extent of the noted waste material and staining, sample, and analyze for the Phase I Parameter List.
- m. Soil Boring Number: S10-44. The boring log indicates that there is "some black staining from 13 to 15 feet, slight" and "some glass, plastic and metal fragments, slough, petroleum odor" from 17 - 22 feet. ESOI shall revise the Recommendations for Phase II Investigation to include additional investigation of the extent of the noted waste material and staining, sample, and analyze for the Phase I Parameter List.
- n. Soil Boring Number: S10-40. The boring log indicates that there is "waste, dark brown to black cinder and ash, black sludge like material with sheen, petroleum odor, very soft and moist, black stained cinder and sand with sheen" from 7 - 20 feet. ESOI shall revise the Recommendations for Phase II Investigation to include additional investigation of the extent of the noted waste material and staining, sample, and analyze for the Phase I Parameter List.

In addition, it is not clear why ESOI did not include this location within the unit boundary. ESOI shall revise the RFI Phase I Report to include this location within the unit boundary or explain why the location should remain outside the unit boundary.

- o. Soil Boring Number: S10-39. The boring log indicates that there is "waste, gravel, black cinders, brick fragments, ash, oil stains, [and] petroleum odor" from approximately 2.5 - 14 feet. ESOI shall revise the Recommendations for Phase II Investigation to include additional investigation of the extent of the noted waste material and staining, sampling of the stained area, and analysis for the Phase I Parameter List.

- p. Soil Boring Number: S10-3. The boring log indicates that from 8 - 10 feet there is "black cinders, gravel and ash." ESOI shall revise the Recommendations for Phase II Investigation to include additional investigation of the extent of the noted ash material, sampling of the ash material and analysis for the Phase I Parameter List.
- q. Temporary Monitoring Well Number: T-57S. The boring log indicates that there is "some black staining from 8 - 9.5 feet." ESOI collected a sample from the 6 - 8 foot interval. It is not clear why ESOI did not collect the sample from the area with black staining. ESOI shall revise the Recommendations for Phase II Investigation to include additional investigation of the extent of the noted staining, sampling of the stained and analysis for the Phase I Parameter List.
- r. Soil Boring Number: S10-41. The boring log indicates that from 8 - 10 feet there is "black cinder, brick fragments, oil stained". ESOI collected a sample from the 6 - 8 foot interval and ended the borehole at 10 feet. It is not clear why ESOI did not sample the stained area and did not continue the borehole to determine the depth of the waste. ESOI shall revise the Recommendations for Phase II Investigation to include additional investigation of the extent of the noted waste material and staining, sampling of the stained area, and analysis for the Phase I Parameter List.

In addition, it is not clear why ESOI did not include this location within the unit boundary. ESOI shall revise the RFI Phase I Report to include this location within the unit boundary or explain why the location should remain outside the unit boundary.

- s. Temporary Monitoring Well Number: T-59S. The boring log indicates that there is "some black staining from 6.5 - 8.5 feet. ESOI shall revise the Recommendations for Phase II Investigation to include additional investigation of the extent of the noted staining, sampling of the stained area, and analysis for the Phase I Parameter List.
 - t. The RFI Phase I Report does not contain well logs for the following wells: BG-1D; BG-1R; BG-1S; T-1D; T-2D; T-2S; T-8D; T-15D; T-35S; T-42S; and T-54S. Revise the RFI Phase I Report to include well logs for these wells.
93. Appendix E, Survey of Existing Terrestrial and Aquatic Habitats Associated with the RFI. The report indicates that Mannik & Smith utilized the Ohio Rapid Assessment Method (ORAM) for wetlands and the Qualitative Habitat Evaluation Index (QHEI) for streams. ESOI shall revise the Phase I Report to include documentation of personnel training and experience in the use of these methods.
94. Appendix F, Analytical Data Validation Summaries.
- a. Appendix F and Appendix H. The data validation summary for SDG-8 (dated December 20, 2002) indicates that lead and tin data from this group had results that were biased high and qualified with a "K." These samples were qualified with a "J" in Table H-1. These samples are among those taken to represent background concentrations for soil. ESOI must submit all laboratory QA/QC information associated with these samples and their analysis. Biased high

background samples leave open the possibility of screening out site-related concentrations of inorganics as attributable to natural background levels and could potentially be not properly protective of receptors.

- b. Appendix F of Volume 2 presents data validation summaries which indicate a number of problems associated with the RFI data (e.g., holding time exceedances) which were evaluated using Region III guidance from 1994 and 1995. Newer versions of the National Functional Guidelines (NFGs, U.S.EPA, 1999 and 2002) have been issued and Ohio has also issued data validation guidance (Ohio EPA, 2003a), based on SW-846 methods and the National Functional Guidelines. Since the facility is not in Region III and newer federal and State of Ohio (Ohio EPA 2003a) data validation guidance exist, the most current guidance should be used to validate the ESOI data.

Additionally, the laboratory QAPP submitted as part of the RFI Work Plan (Appendix A, Attachment 3) addresses some of these same issues (e.g., holding times for organic samples). ESOI shall revise the Phase I report to reflect adherence to the procedures prescribed in the laboratory QAPP.

- c. Appendix F indicates problems with surrogate recoveries for organics methods (e.g., SDG-3, 6, 13, 16, 17, 18, etc.). U.S.EPA National Functional Guidelines for Organic Data Review (1999) and SW-846 Method 8000b (which addresses surrogate recoveries for 8260B and 8270C) indicate that if surrogate recovery is not within established limits, and no instrument problem is found, the sample should be re-extracted and re-analyzed (or just re-analyzed for 8260B). The data summaries do not indicate re-analysis was performed when these surrogates were out of established limits and do not indicate that instrument problems were found. The National Functional Guidelines for Organic Data Review (October 1999) indicate, "the laboratory failed to perform acceptably if system monitoring compounds are outside criteria with no evidence of re-analysis."

Did the laboratory perform re-analyses as indicated by the method(s)? If so, document the results. If not, explain why not and how - if ESOI plans to make use of the data - they can attest to its usability given the specific QC problems with that sample and its purpose within the RFI.

- d. ESOI should submit complete laboratory QC data for the Otter Creek sediment samples to allow for an assessment of data validation procedures (using a subset of the entire data set) completed by Mannik & Smith. This submittal should include bench sheets (e.g., moisture analysis, SVOC extraction, etc.), raw data for samples and QC samples, surrogate information, sample receipt form(s), data narrative(s), internal standards information, chromatograms, etc. And information associated with any sample re-analysis.
- e. Validation Summaries. Data validation summaries (e.g., SDG-4, 6, 11, 14, 17, 18, etc.) indicate that holding times for organic analyses only apply to water samples and that holding times for sediments/soils are "currently under review" (since Region III guidances were published in 1994/1995). They further state that samples' results don't become "J" qualified until holding times are exceeded by at least double. As referenced above, NFGs and/or Ohio guidance should be used to assess the data including holding times. Additionally, the laboratory

QAPP submitted with the RFI Work Plan indicates that holding times will be followed for organic methods (not differentiated by media type). Specific dates should be provided for date of sample collection and dates of holding times for analysis (and sample extraction when applicable). At a minimum, RFI Phase I samples that failed to meet the organic method standards in the approved QAPP shall be qualified accordingly and the Phase II investigation shall be revised accordingly.

- f. Summary for SDG-27, Addendum 2. This summary indicates that samples were analyzed for 6 PAHs using GC/MS/SIM. ESOI shall revise the Phase I Report to specify why this was done (here and in other SDGs), how the specific PAHs were selected, and what the results of this alternate method (SIM) indicate.
- g. Summary for SDG-26. This summary indicates that herbicide holding times were not met (a separate issue) due to the lack of Diazald, a compound used to derivatize the herbicides. 1-Methyl-3-nitro-1-nitrosoguanidine was used in place of the Diazald. ESOI must submit information regarding the acceptability of this substitute (e.g., U.S. EPA guidance, etc.) or other information verifying this compound was as effective as Diazald (e.g., published literature describing a study of comparison).

95. Appendix H, Evaluation of Background Soil Concentration for Metals.

- a. Appendix H, Evaluation of Background Soil Concentrations for Metals. Background samples should be taken from the same soil strata (when possible - i.e., that strata is a local/native soil type) as the samples they are being compared to. Taking background samples from a variety of soil types/strata would likely give more spread to the data which would statistically generate higher (less conservative) background values. Because of the possibility of artificially elevated background values, this approach is unacceptable. Background data should be segregated by soil strata. The purpose of generating a background value is to make an estimate of naturally occurring levels for that soil type. Levels exceeding these background values are presumed to result from anthropogenic influences. As such, these soils must pass risk assessment for their designated uses. This risk level must be assessed based on total concentrations present for all metals not screened out using site-specific background values (calculated following established procedures in U.S. EPA guidance). If all background samples were taken from the same strata and that strata is comparable to all other site-related samples from local/native soils, document that in the RFI report. Assessment of strata can be augmented through the use of other soil parameters such as TOC, pH, grain size distribution, iron content, calcium carbonate, etc.
- b. Page H-1, Paragraph 4. Background sample sets are not large enough to apply bootstrap methodology. Chernick (1999) indicates that "in many practical contexts, the number 30 is used as a "minimum" sample size. "This text then goes on to recommend a minimum number of samples (n) of 50. An alternate statistical assessment is required for the smaller number of background samples available.
- c. Page H-2, Paragraph 0. ESOI proposes to use the values presented on Table

H-2 for the data evaluation. These values include the statistical outliers for which ESOI argues were carefully reviewed to determine whether there was a reasonable basis for excluding them from the calculations (e.g., laboratory error, data transcription error, inappropriate sampling location). ESOI determined that there was no reasonable basis for excluding the outliers.

The use of the one detection of antimony as the background level is not permissible. This detection appears to be an outlier and may reflect anthropogenic influences. The same may be true for Cobalt, which has two detections significantly greater (10X) than the levels used for the undetected compounds (or may relate to soil strata differences). The minimal number of detects (at levels considerably above the non-detect level) do not define a distribution. ESOI should either make a more conservative assessment of background or justify that these samples reflect an actual background population through the collection of additional background samples (which should be linked with other soil assessment parameters to verify they are reflective of actual background soil strata).

Ohio EPA applied the following criteria to ESOI's background soil data set and determined that the outliers must be excluded since all of the criteria have not been met.

1. Was a bias identified by QA/QC? According to ESOI, no bias was identified.
2. Is the outlier an order of magnitude greater than the mean of the other background data points? Yes for antimony.
3. Does the outlier produce a statistical limit above the risk-based standard? ESOI's risk based standards are not acceptable so this question was not evaluated.
4. Does the outlier fall within the range of regional background? ESOI did not site any regional data supporting that the outlier data falls within acceptable background range. Data from The Ohio State University (OSU 1983) is available for copper, cadmium, lead, nickel, zinc and chromium. ESOI's data fell outside the range of regional background for chromium, copper, and lead.

In addition, ESOI states that the "removal of the outlier concentrations does not have a significant effect on the 0.95 UCL values, except for antimony and cobalt if the maximum detected concentrations are considered outliers." Values are blank for "0.95 Bootstrap UCL" for these compounds. The text indicates that "for antimony and cobalt, the maximum detected concentrations are used to represent background levels because only a few samples had detectable concentrations." Please reference this statistical approach. Delete the outliers and use the Method Detection Limit or human health-based criteria and EDQLs, whichever are lower, for comparison to SWMU and AOC samples.

RFI Phase I Soil Split Sample Comparison						
COC	Soil Sample Location: SWMU 5, T-22		Soil Sample Location: SWMU 5, T-21		Soil Sample Location: SWMU 5, T20	
	Ohio EPA Conc. mg/kg	ESOI Conc. mg/kg	Ohio EPA Conc. mg/kg	ESOI Conc. mg/kg	Ohio EPA Conc. mg/kg	ESOI Conc. mg/kg
Arsenic, Total	145	170	16.5	22	6.47	8.6
Barium	93.8	72	111	44	117	99
Beryllium, Total	0.669J	0.6	0.811	0.5	0.926	0.9
Cadmium, Total	1.77	1.6	1.70	U (0.05)	1.13	0.8
Cobalt, Total	5.04	U(2.5)	9.35	U (2.5)	12.8	U (2.5)
Chromium, Total	31.0	24	27.2	15	24.1	0.8
Copper, Total	99.7	74	36.1	23	20.2	24
Nickel, Total	24.3	23	32.8	34	29.3	23
Lead, Total	2010	1000	451	23	15.3	94
Tin, Total	7.51J	9.3	ND	3.5	ND	3.6
Vanadium, Total	30.1	23	34.4	19	41.7	33
Zinc	186	200	119	64	85.6	72
	Ohio EPA Sample ID: S-SWMU5-T22-090402 ESOI sample ID Number: S-F20C7P1-090402-NAB- 151		Ohio EPA Sample ID: S-SWMU5-T21-090502-001 ESOI sample ID Number: S-F20C7P1-090502-NAB- 153		Ohio EPA Sample ID: S-SWMU5-T-20-090502 ESOI Sample ID Number: S-F20C7P1-090502-NAB- 158	

RFI Phase I Ground Water Split Sample Analysis Results

Well ID	Constituent	Ohio EPA Concentration µg/l		ESOI Concentration µg/l
T-5D	acetophenone	4.70 J		UJ (10)
	bis (2-ethylhexyl) phthalate	6.39		UJ (10)
	di-n-octyl phthalate	5.70	4.68 J	UJ (10)
	acetone	4.28 J	6.8 J	U (10)
	benzene	0.295 J		U (1)
	cyanide	7.64 J		U (10)
	sulfide, acid soluble	500 J		U (1000)
	boron total	803		NR
	strontium total	1320		NR
	aluminum total	1020		NR
	arsenic total	22.2		18
	barium total	93.2		67
	calcium total	13800		NR
	copper total	5.76 J		U (25)
	potassium total	68100		NR
	magnesium total	2510		NR
	manganese total	24.6		NR
	sodium total	97300		NR
	lead total	5.97		11
	zinc total	9.52 J		U (25)
	antimony total	.716 J		U (5)
	selenium total	1.49		19
	thallium total	0.24		U (4)
	boron dissolved	740		NR
	strontium dissolved	1080		NR
	aluminum dissolved	120		NR
	arsenic dissolved	5.86		17
T-5D	barium dissolved	37.3		U (50)
	calcium dissolved	4730		NR
	copper dissolved	5.33 J		U (25)

Well ID	Constituent	Ohio EPA Concentration µg/l	ESOI Concentration µg/l
	potassium dissolved	70100	NR
	magnesium dissolved	1290	NR
	manganese dissolved	3.81 J	NR
	selenium dissolved	1.46	19
	thallium dissolved	0.243	U (4)
T-11D	boron total	1110	NR
	aluminum total	14500	NR
	barium total	227	310
	beryllium total	1.09 J	U (1)
	calcium total	59600	NR
	cobalt total	10.1 J	U (50)
	chromium total	21.5	56
	copper total	17.7 J	U (25)
	potassium total	13900	NR
	magnesium total	15.4	NR
	manganese total	320	NR
	sodium total	61.2	NR
	nickel total	24.5	45
	lead total	13.3	7.4
	vanadium total	30	96
	zinc total	51.7	U (25)
	arsenic total	25.9	U (10)
	strontium total	2220	NR
	antimony total	0.504 J	U (5)
	selenium total	1.51	9.6
	thallium total	0.443	U (4)
T-11D	boron dissolved	925	NR
	barium dissolved	70.6	79
	calcium dissolved	9230	NR
	potassium dissolved	9030	NR
	magnesium dissolved	5460	NR

Well ID	Constituent	Ohio EPA Concentration µg/l		ESOI Concentration µg/l
	manganese dissolved	1.39 J		NR
	sodium dissolved	56600		NR
	strontium dissolved	1840		NR
	antimony dissolved	0.535 J		U (5)
	selenium dissolved	1.82		14
	thallium dissolved	0.139		U (4)
	cyanide	5.09 J		U (10)
T-20S	bis (2-ethylhexyl) phthalate	10100 Dup 9950	4660 I 11600	396 J
	phenanthrene	188		10.86
	pyrene	139 J		R
	Acetone	10.7 J		UJ (10)
T-20D	4,4'-DDT	0.0589 J		U (0.1)
	di-n-octyl phthalate	13.0		UJ (10)
T-37D	mercury total	0.075 J		U (0.2)
	boron total	1030		NR
	strontium total	2390		NR
	aluminum total	66800		NR
	arsenic total	35.9		31
	barium total	547		490
	beryllium total	3.6 J		3.1
	cobalt total	53.6		U (50)
	chromium total	110		87.11
T-37D	copper total	125		60
	potassium total	18700		NR
	magnesium total	78600		NR
	manganese total	2230		NR
	sodium total	64000		NR
	nickel total	124		87
	lead total	68.3		44
	vanadium total	109		120

Well ID	Constituent	Ohio EPA Concentration µg/l	ESOI Concentration µg/l
	zinc total	273	160
	calcium total	485000	NR
	antimony total	3.03	U (5)
	selenium total	4.04	37
	thallium total	1.89	U (4)
	boron dissolved	1030	NR
	strontium dissolved	1360	NR
	aluminum dissolved	276	NR
	barium dissolved	56.4	59
	calcium dissolved	13500	NR
	potassium dissolved	1860	NR
	magnesium dissolved	4540	NR
	manganese dissolved	33.7	NR
	sodium dissolved	58200	NR
	zinc dissolved	17.2 J	U (25)
	antimony dissolved	3.98	18
	selenium dissolved	1.11	U (25)
T-37S	benzene	0.164 J	U (1)
	ethyl benzene	0.337 J	U (1)
	tetrahydrofuran	9.62 J	10.8
	toluene	2.01 J	U (1)
T-54S	acetophenone	32.3	68.9J
	di-n-octyl phthalate	6.9	UJ (10)
	benzene	0.283 J	U (1)
	tetrachloroethene	1.29 J	U (1)
	toluene	0.48 J	U (1)
	boron total	344	NR
	aluminum total	29100	NR
	barium total	245	350
	beryllium total	2.58 J	U (1)
	calcium total	313000	NR

Well ID	Constituent	Ohio EPA Concentration µg/l	ESOI Concentration µg/l
	cobalt total	15.4 J	U (50)
	chromium total	41.2	69
	copper total	54.6	U (25)
	potassium total	12600	NR
	magnesium total	159000	NR
	manganese total	1740	NR
	nickel total	45.8	61
	lead total	33.6	27
	strontium total	1960	NR
	vanadium total	59.9	140
	zinc total	108	130
	arsenic total	31.8	37
	sodium total	143000	NR
	antimony total	0.991 J	U (5)
	selenium total	5.31	36
	thallium total	1.14	U (4)
	boron dissolved	247	NR
	aluminum dissolved	74.8 J	NR
	barium dissolved	29.7	U (50)
T-54S	calcium dissolved	244000	NR
	potassium dissolved	4400	NR
	magnesium dissolved	141	NR
	manganese dissolved	1180	NR
	nickel dissolved	6.63 J	U (25)
	lead dissolved	4.03 J	U (5)
	strontium	1870	NR
	zinc dissolved	6.45 J	U (25)
	sodium dissolved	141000	NR
	antimony dissolved	1.18	U (5)
	selenium dissolved	4.83	18
	thallium dissolved	0.49	U (4)

Well ID	Constituent	Ohio EPA Concentration µg/l	ESOI Concentration µg/l
BG-1D	aluminum total	1340	NR
	boron total	888	NR
	barium total	62.7	75
	calcium total	12300	NR
	copper total	7.6 J	U (25)
	potassium total	17200	NR
	magnesium total	6190	NR
	manganese total	32.2	NR
	sodium	71500	NR
	strontium total	1740	NR
	zinc total	9.69	U (25)
	arsenic total	2.59 J	U (10)
	lead total	2.57 J	U (5)
	antimony total	0.866 J	U (5)
	selenium total	1.04	16
	thallium total	0.162 J	U (4)
	aluminum dissolved	170	NR
BG-1D	boron dissolved	853	NR
	barium dissolved	58.9	U (50)
	calcium dissolved	8680	NR
	copper dissolved	9.45	U (25)
	potassium dissolved	16800	NR
	magnesium dissolved	5370	NR
	manganese dissolved	3.02 J	NR
	sodium dissolved	73800	NR
	strontium dissolved	1720	NR
	zinc dissolved	6.45 J	U (25)
	antimony dissolved	0.805 J	U (5)
	selenium dissolved	0.991 J	13
	thallium dissolved	0.114 J	U (4)
BR-1R	aluminum total	222	NR

Well ID	Constituent	Ohio EPA Concentration µg/l	ESOI Concentration µg/l
	boron total	497	NR
	barium total	34.8	U (50)
	calcium total	77300	NR
	copper total	6.47 J	U (25)
	potassium total	5430	NR
	magnesium total	11300	NR
	manganese total	15.7	NR
	sodium	66300	NR
	strontium total	8550	NR
	zinc total	8.51 J	U (25)
	Antimony total	0.5 J	U (5)
	aluminum dissolved	301	NR
	boron dissolved	490	NR
	barium dissolved	33	U (50)
	calcium dissolved	71900	NR
BG-1R	copper dissolved	5.43 J	U (25)
	potassium dissolved	5210	NR
	magnesium dissolved	10200	NR
	manganese dissolved	14.8	NR
	sodium dissolved	63900	NR
	strontium dissolved	8080	NR
	zinc dissolved	7.41 J	U (25)
Constituents are only listed if they were detected by Ohio EPA. J= estimated value NR= No Result Reported U()= not detected with the sample quantitation limit in parentheses R= Rejected			

PHASE II WORK PLAN

5.1 Summary of Phase II Sampling Plan

1. Page 116 of the Phase II Work Plan recommends limited additional sampling,

which is specified in Work Plan Table 5.1 and Figure 5.1. No assessment of ecological risks is proposed or discussed in the Phase II Work Plan. Page 4-13 of the Phase I Work Plan states that "if the results of the screening level analysis do indicate that a more detailed assessment of ecological risk is appropriate, then a Work Plan will be prepared." Despite substantial risks with some hazard quotients (HQs) greater than 100 (e.g., Phase I RFI Report, Table 4.12, mercury exceeds the screening level by 1500 times), the Phase II Work Plan does not provide any recommendations for "a more detailed assessment of ecological risk."

Prior to proceeding with a Phase II Work Plan, the following are recommended:

- (1) A screening ERA should be performed to identify COPCs according to current EPA guidance. The ERA should include an analysis of uncertainties and data gaps that should be used to guide future investigation activities.
 - (2) The additional ecological risk assessment issues identified in this technical review should also be addressed in a revised Phase I Report.
2. Any proposed sampling locations should be presented on larger scale maps for individual AOCs, IAs, and SWMUs. Only ERA specific samples should be shown (e.g., do not include any subsurface soil samples that would not be used in the ERA). The current large format map (43 x 36 in) is difficult to review, particularly in electronic format, and the current sampling locations could not be adequately evaluated. Sample locations to support the ERA should be shown in separate figures for each AOC, IA, and SWMU investigated. The information in Table 5-1 should be provided in separate ecological and human health risk assessments tables that address data gaps (i.e., only include groundwater samples (near surface water) and soil (surficial only) that will be used in the ERA).

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